THE IRON AGE

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Studies on Migration of Industry

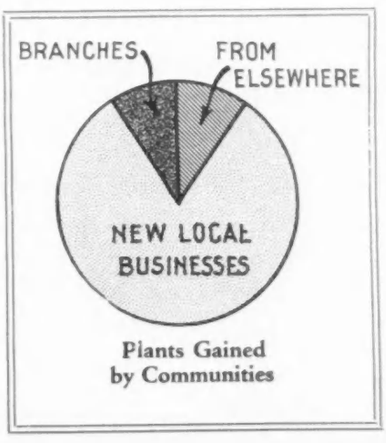
Industrial Methods of Communities —Reasons Underlying Location or Relocation of Plants—Growth in Smaller Cities

SEVERAL months ago studies were put under way by the Policyholders' Service Bureau of the Metropolitan Life Insurance Co., in conjunction with the Civic Development Committee of the National Electric Light Association, with the object of determining the reasons underlying movement of industries from one community to another and from one general area of the country to another. At the same time, the location of new industries within given areas or communities was studied, as well as the reasons back of the losses, sustained by certain communities, in the industrial fabric of the country.

What follows is taken from a summary of the survey, and from an address delivered by William J. Barrett of the Policyholders' Service Bureau, which was read before the Connecticut Chamber of Commerce, Hartford, last May.

Two forces are causing considerable thought to be given to the subject of industrial development. (1) Many cities have come to realize that their social and economic advancement depends upon the industries within their borders, and are beginning to give attention to those industries and to the securing of additional payrolls. Industry, on the other hand, has been caused to study intensively its present location and, where movement is contemplated, to arrive at a future location by scientific means.

Many of the larger cities, realizing that they cannot depend entirely upon past momentum, have set about actively to exploit their advantages of a large market, established industries, available labor supplies and intensive transportation facilities. Smaller communities have been active in urging the advantages of stable labor and ideal working and living conditions.



Plants Gained by Communities

It has been estimated that nine-tenths of all industries are improperly located. They have been placed where they are by rule-of-thumb methods, for personal reasons, or for other causes of unscientific character. In many cases the inadequacy of present location is a result of changed conditions.

Mergers and consolidations are doing a great deal to focus attention on proper location. Keen competition, foreign and domestic, has caused industry to seek the lowest possible costs, both in production and in distribution. It is realizing that strategic location is an important factor in lowering costs to the consumer.

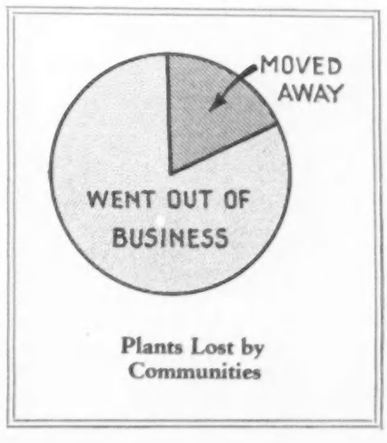
Industrial relocation since the World War has had wide publicity. Among the larger groups of movements have been that of the cotton textile industry to the Southern States, the setting up of an immense rayon industry in the South, development of a large shoe industry in the St. Louis territory, movement of the center of the steel industry from Pittsburgh and development of the Kraft paper industry in the South.

To secure their share of gain in these shifting industries many communities have sought to attract individual plants. Advertising campaigns, offering freedom from taxation, in some cases providing rent-free factories for a period of time, have been among the means used.

How the Survey Was Made

Two general objects of the survey were: (1) To measure for a two-year period, in terms of number of plants and of employees, the extent and nature of certain phases of industrial developments in the United States and Canada; (2) to define the underlying economic reasons which brought about these changes.

In studying the question, information was gathered concerning the name of a company participating in any one of the three items mentioned on page 1090, together with data on the product manufactured, the number of employees, sources of capital



Plants Lost by Communities

of new local industries and reasons underlying the development. In addition, movements away from a given community and information regarding firms which had gone out of business were sought, but with less success.

Both questionnaire and personal interview were utilized in securing the desired data. It was recognized that there are four distinct types of industrial development:

1. Growth resulting from the acquisition of industries which have moved to a given point from another city—a relocation.
2. Growth through the establishment of branch plants.
3. Growth through the organization of new local industries.
4. Growth through the expansion of existing industries—a phase which was not included in the survey.

Reports were had from 1934 cities or communities in the United States and 150 in Canada, representing 90 per cent of those in the United States with 10,000 or more people and one-third of those having between 2500 and 10,000, together with a large number of smaller communities, and two-thirds of the urban population of Canada. The information covered more than 16,000 firms, employing approximately 600,000 workers. More than 10,000 plants were gained by the 2084 communities.

Bodily shifting of industry from one community to another, although it has assumed much importance in the public eye, is on a relatively small scale. Such relocations account for only 10 per cent of the plants gained by the different communities. New local industries represented over 80 per cent of the growth in number of plants; branch plants were responsible for about 9 per cent. Thus, the outstanding factor in industrial development is the upbuilding of a community by new local industries.

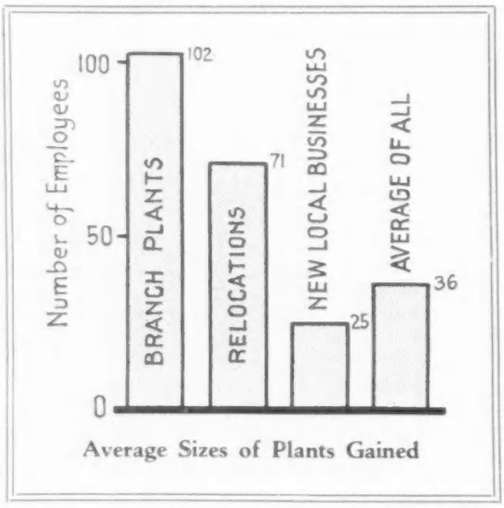
Branch plants proved to be larger than any of the others studied, averaging 102 employees. This compares with 71 employees in the average relocation of plants and only 25 in the average of new local plants. The average for all plants gained by communities was 36 employees.

In the two-year period covered by the study the various communities lost 5908 plants, or about 58 per cent as many as the plants which were gained. Of the losses, 82 per cent went out of business; the remaining 18 per cent moved away. The average size of plant lost was 35 employees.

Growth of Industry in Small Places

SMALLER communities are growing in importance as industrial locations. This includes both the isolated small city and the suburban community. Several underlying motives for the growth of industry in smaller communities are: Stable labor supply, good living and working conditions, lack of congestion, ease of transportation and available power. The suburban community offers the advantages of the large city, without its disadvantages.

Cities under 10,000 population received more than one-quarter of all branches reported, more than one-sixth of the relocations and one-tenth of the new local industries. Most frequently mentioned as reasons for this movement were, in order of frequency: Markets, labor, transportation, materials, available factory buildings.



Average Sizes of Plants Gained

Information on plants lost was difficult to secure. Such communities as have the data do not care to give it out. Information was obtained, however, from plants which had moved, of their reasons for leaving their earlier locations.

One plant locating in a small community found it difficult to hold a supervisory force. These people had become accustomed to the social and recreational advantages of a large city and missed them greatly in the small community.

In another case, a gray iron foundry was located in a small community. The growth of the business was rapid and a considerable expansion was needed shortly. Investigating the labor supplies in the community and adjacent territory, the management found that present requirements were absorbing practically the entire employable population. It thus became impossible to make the needed expansion at that point.

One small community was found so favorable for industries that its industrial development has gone considerably ahead of its size and recreational facilities. It has started to provide such facilities, as a partial result of which land values in the retail business section have gone skyward.

One reason for a recent movement of industries to small cities lies in the fact that many of them have, within the past five years, received the advantages of electric power service formerly enjoyed only by the larger communities. This has made it possible for industries to locate in these smaller places with full assurance of dependable 24-hr. electric service from an inter-connected system. It is significant that the preponderant movement in six of the nine geographical areas is from the larger to the smaller cities.

Middle Atlantic States Gained Most

Of the movement of an industry from one community to another, that between the Middle Atlantic States (New York, New Jersey and Pennsylvania) and New England is of some interest. Practically 86 per cent of the movement into New England was from the Middle Atlantic States, the principal trend being from New York into Connecticut. Conversely, most of the plants moving out of New England went into the Middle Atlantic States.

As a whole, the Middle Atlantic States showed the greatest gains due to relocations of industry, with New England second. The Middle Atlantic States led in new branch factories, with East North Central territory second. The Middle Atlantic States are substantially ahead in establishment of new local plants; New England stands second in this respect.

Cold Worked Gun Forgings

The forgings for guns manufactured during the past year have all been cold worked, according to Major-General C. C. Williams, chief of ordnance, United States Army. At a meeting of the Army Ordnance Association, Oct. 10, he said that 165 forgings have now been produced by this method and not one has failed in service. Watertown Arsenal has continued to make minor improvements in the process and equipment, but the process is now standardized and is highly satisfactory.

Evolves New Beehive Coke Process

Humphreys Coal & Coke Co., After Long Experiments, Obtains Product Meeting New Specifications of Foundries

MORE exacting coke specifications from foundry consumers and growing competition from by-product coke producers have led the Humphreys Coal & Coke Co., Greensburg, Pa., to evolve a process for manufacturing beehive coke comparable with by-product coke in both physical characteristics and chemical analysis. The Humphreys company, a subsidiary of American Radiator Co., with mines and ovens in Westmoreland County, Pa., operates in the famous "Old Basin" Connellsville seam.

During the many years of its history Humphreys beehive foundry coke has enjoyed a good reputation, both for its chemical and physical characteristics. Until recently, however, the coke was manufactured from coal that received no preparation or refinement prior to coking; nor was any effort made to control the porosity and shatter qualities or weight by formulæ in the introduction of air into the ovens. As the coke requirements of modern foundries became more exacting, the company realized that, if it were to supply satisfactorily the foundries of the parent company, as well as a large outside trade, improvements in beehive coke would have to be introduced.

The Humphreys situation was complicated because the company's production of coal is limited under its leasehold to a comparatively small tonnage, equivalent only to the requirements of its battery of 145 ovens. With this limitation there was an additional reason for producing a quality product marketable at a premium price.

What Foundries Now Expect of Coke

A better understanding of the problems that faced the Humphreys company in getting out a product which would meet the test of modern usage is afforded by the following comparison of characteristic specifications of today with those of a few years ago:

Old Specifications	New Specifications
Shatter index (standard of the American Society for Testing Materials used) 60 to 65 per cent on a 2-in. screen	Shatter index over 85 per cent.
Porosity—its utility not understood.	Porosity variable from 48 per cent to 55 per cent to suit the requirements of the consumer.
Weight per cu. ft.—its importance not valued.	Weight per cu. ft.—29 to 33 lb. to suit the requirements of the consumer.
Ash—less than 12 per cent	Ash—as low as possible, consistent with structure; preferably less than 10 per cent.
Sulphur—less than 1 per cent	Sulphur—less than 0.75 per cent.
Volatile and moisture as low as possible.	Volatile and moisture low with a correspondingly high fixed carbon, which should be 89 per cent or over.

In setting out to meet the new specifications outlined

GENERAL View of Surface Plant, Showing Pangborn Dust Arresters and Classifiers on Right, Preparation Plant in Center, and Ovens on Extreme Left

on page 1091, the company installed a laboratory at its plant and engaged a chemist and metallurgist. This laboratory is believed to be the first of its kind in the Connellsville district. With the laboratory in operation, a series of experiments covering a period of three years was undertaken. In these experiments the company sought to determine the proper type of mechanical coal cleaning equipment to install, the best size of coal to make the toughest coke in beehive ovens, and the proper size of coal to give the most efficient separation. Exhaustive study was made of the further desulphurization of coke by use of acid in the coal, and methods of introducing air into the ovens to improve and assume control over porosity, weight and shatter index. Nearly all of this work represented pioneering in beehive coke manufacture.

The extent to which the company has been successful in solving these problems is best illustrated by the following typical analysis of its foundry coke:

Shatter Index:			Per Cent
On 3-in. screen	76 per cent	Moisture	0.60
On 2-in. screen	88 per cent	Volatile matter	0.70
Porosity	52 per cent	Fixed carbon	89.55
Weight per cu. ft.	32 lb.	Ash	9.75
		Sulphur	0.66

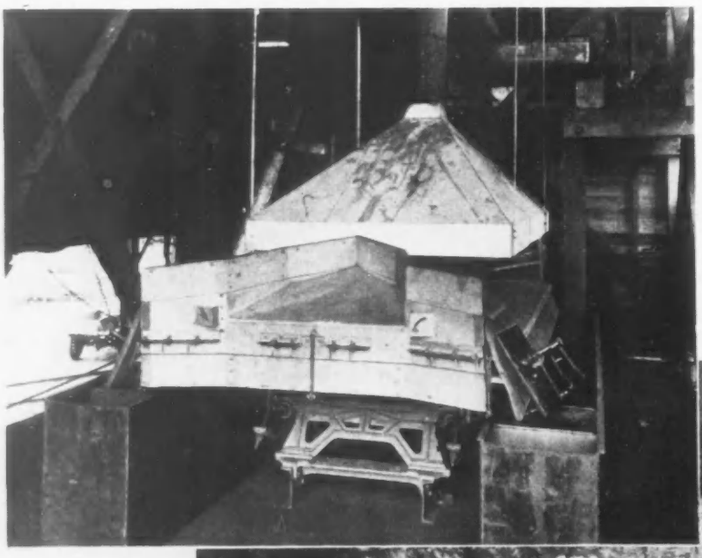
Pneumatic Separation Utilized

After the coal is brought to the preparation plant from the nearby mine, it is first crushed to a proper fineness and then passed over pneumatic separators, furnished by the American Coal Cleaning Corporation. Here a novel arrangement has been introduced by giving all the coal a primary treatment and a portion of it a secondary treatment over the separators. This is done to insure uniform chemical quality. With only one treatment, which is customary, an extra quantity of refuse in the feed coal may not all be eliminated, but with a secondary treatment complete elimination to a predetermined standard is assured. After the coal has been run through the separators, it is given a treatment of acid to reduce further the sulphur content of the resultant coke.

After the coal passes into the ovens and during the entire coking period, operation is regulated with extreme care to insure the proper porosity, weight and shatter index. The porosity and weight per cu. ft. can be and are varied to suit the requirements of the various customers. This diversification ranges in porosity from 49 to 56 per cent, and in weight per cu. ft. from 28 to 34 lb. This effort on the part of the producer to meet the requirements of its customers is another recognition by the Humphreys company of the economies in foundry operation to be derived from the use of the proper kind of coke.

Sea Coal Produced as By-Product

During the process of coal beneficiation by the pneumatic process, considerable fine dust is produced. This is collected by means of Pangborn dust arresters, which have been erected adjacent to the preparation plant, and is classified into two sizes which are marketed as sea



ONE of the Pneumatic Separators in Cleaning Plant. Here all coal is given a primary treatment, and a portion of it a secondary treatment over the separators to insure uniform chemical quality

THE Structure of the Coke Before Hand - Drawing from a Beehive Oven Is Clearly Shown in This View

HAND - Drawing of the Coke Has Little Effect on the Size Because of Its Toughness

coal, or as an alternative can be re-introduced into the coking coal.

The analyses of the two grades of sea coal are:

No. 1 Grade	Per Cent		Per Cent
		Volatile matter	30.5
		Fixed carbon	62.5
Through 100 Mesh	94	Ash	7.00
Through 200 mesh	62	Sulphur	0.80
No. 2 Grade		Volatile matter	31.4
		Fixed carbon	61.55
Through 100 mesh	60	Ash	7.05
Through 200 mesh	20	Sulphur	0.83

While this sea coal might be termed as a by-product of the coal preparation plant, the No. 1 grade is comparable with the highest grades which are manufactured.

Each car of foundry coke is tested for shatter index, porosity and weight per cu. ft. and analyzed for volatile matter, moisture, ash, fixed carbon and sulphur. Through the laboratory close control is maintained over the proper functioning of the coal crushing and coal separation plants, as well as the proper formulæ for air control of the ovens. In fact, the laboratory is used to exercise control over the coal from the mines to the finished coke in cars. Every active working place in the mines is analyzed at stated intervals, and an inactive place is not resumed until a complete analysis is made.

Enlarge Old Motor for Reversing Blooming Mill Drive

BY G. P. WILSON*

REVAMPING of a motor driving a reversing blooming mill at the Indiana Harbor, Ind., works, Youngstown Sheet & Tube Co., to accommodate larger equipment, was recently accomplished by increasing the size of the motor from 5000 hp. at 40 r.p.m. to 8000 hp. at 50 r.p.m. The old motor, installed on the 35-in. blooming mill in 1918, was supplied with power from a 3500-kw. flywheel motor-generator set with two 1750-kw., 600-volt, d.c. generators.

Increasing the power of the motor necessitated the replacement of the present armature copper with greater cross-section, to allow for this increased rating. To improve operating conditions further on the motor, under peak-load conditions, tapered inter-poles were provided on the machine and new compensating and commutating windings. The old shunt field coils were removed and new field coils with improved insulation were provided.

New end bells and baffle plates were installed, which will improve the ventilating condition of the machine. Redesigning the ventilation of the motor in line with present-day practice, and increasing its horsepower to 8000, necessitated increasing the amount of air to the motor from 40,000 cu. ft. to 80,000 cu. ft. a minute.

*General engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh.

The increased horsepower rating of the motor required new generators which would have a combined rating of 6000-kw. and a 5000 hp. driving motor for these generators. The speed of the mill motor was raised from 40 to 50 r.p.m. by increasing the voltage of the generators from 600 to 700. The new set and the revamped motor are provided with a new control, and a foot-operated master switch replaces the old hand-operated master switch. The field relays for the motor and generator are of the latest improved type. This new control will increase the performance of the set enabling faster acceleration and increased over-all performance to be made.

The old flywheel set and control will be left installed as a standby, so that the motor may be operated from either the old set or the new, thus assuring available power for driving it. The motor has a spare armature also, so that this arrangement of the two motor-generator sets will make the power supply conform to the spare that is available for the motor.

When completed the installation will be the only one of its kind operating in steel mills, and will be the second largest reversing mill installed. Comparison of the operation of the new foot-master control with the old hand-operated control will then be possible.

Heat Treating Woodsmen's Axes

Lead and Salt Baths, Electrically Heated and Automatically Controlled, Improve Output and Cut Costs Made by Semi-Muffle Furnaces

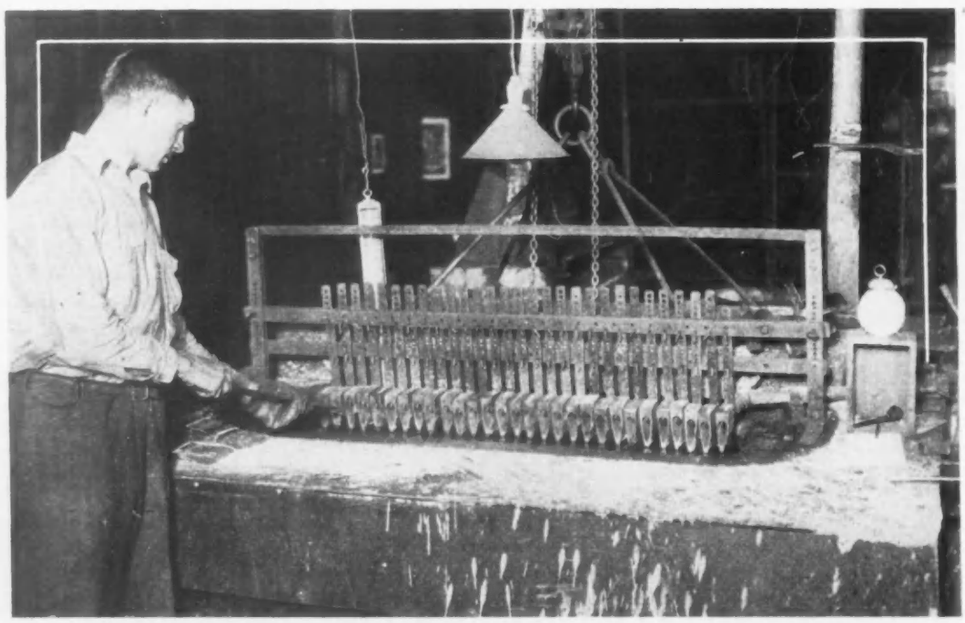
AN opportunity to appraise the over-all costs of heat treating carbon steel tools, and to show that reduction in collateral costs may overbalance an increase in fuel cost, occurred in the plant of Warren Axe & Tool Co., Warren, Pa., manufacturer of high-grade axes and logging tools of some 33 years' experience. As described by Wirt S. Scott, Westinghouse Electric & Mfg. Co., Mansfield, Ohio, in a paper before the meeting on fuels, American Society of Mechanical Engineers, Philadelphia, Oct. 7, the body of an axe is forged from low-carbon steel, and to this is welded the cutting edge, consisting of high-carbon crucible steel. Only the blade or cutting bit needs to be hardened; hence it is unnecessary to heat the entire axe except for obtaining a blue temper color, which is a characteristic and advertised feature of the company's highest grade tools.

In the past, in order to secure the best results obtainable from fuel-fired furnaces, each axe was individually hardened and tempered. Despite the utmost care in heat treatment and testing, the necessary free replacements of tools sold under an unconditional guarantee became an appreciable item, and one to be eliminated if possible. This resulted in extensive investigation of new ideas and new methods of heat treating the parts, particularly as applied to tempering.

Prior to electrification, the axes were heated in semi-muffled, gas furnaces. Individual treatment was thought to produce the ultimate quality. The possibility for error in judgment on the part of the heat treater was appreciated, but this was minimized by the employment of experienced heat treaters.

To secure the dark blue color of tempered steel was the aim of the heat treaters in the final operation, but the accomplishment was a matter of judgment, subject to many variables and resulted in different shades of tempered steel and different degrees of hardness. To improve the quality of product, and to secure the most dependable uniform quality, it was decided to eliminate some of the variables, and reduce others to a minimum, through the use of electric heat, regardless of the operating cost.

After electric furnaces were put in operation, the entire method of heat treatment was reversed. Equipment included batch-type, semi-continuous operation, bath-type furnaces in place of hearth type; separate hardening and tempering furnaces; one hardening and one tempering furnace in place of five combination hardening and tempering furnaces.

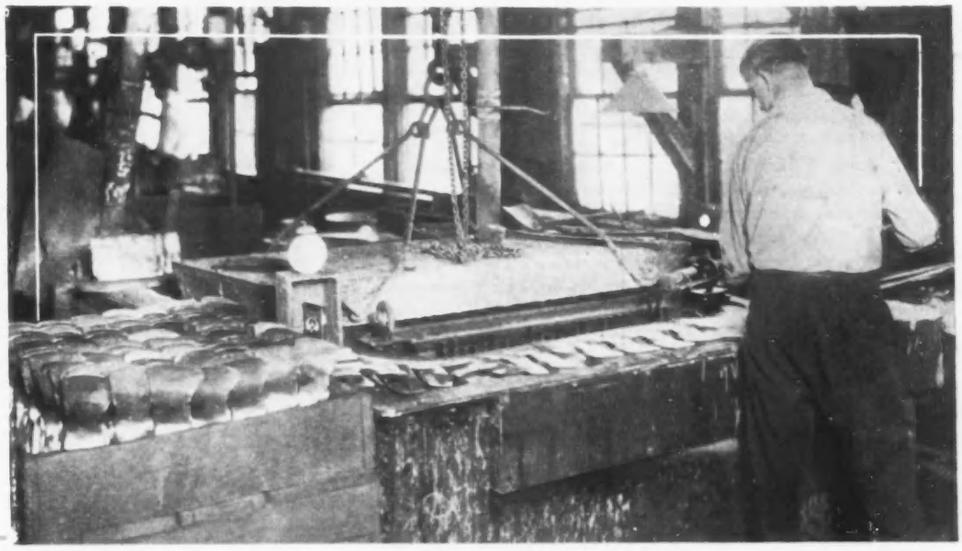


SALT Tempering Bath, with 29 Single-Bit Axes in the Bath. Hot axes are replaced by cold ones at regular intervals. Steady operations and unique current control hold temperature of bath within close limits

The electric furnaces are of the rectangular bath-type, consisting of a steel plate shell, lined with heat-insulating and refractory brick. Heating elements formed of return-bend coils of nickel-chromium resistors are suspended from hooks anchored in the side walls, and also placed in the bottom in suitable refractory spacer blocks.

The vessel for the bath is made of cast nickel-chromium alloy, supported from an upper flange. A nickel-chromium protective apron is placed around the flange, and over this is laid a steel top plate, to protect the brick work from damage, and prevent the molten material from entering the heating chamber.

The hardening bath is operated at a temperature of 1405 deg. Fahr.; the vessel is 22 in. wide by 60 in. long and 14 in. deep. The electrical capacity is 65 kw.



TEMPERING Double-Bit Axes in a Special Salt Solution That Tempers and Blues the Axe at the Same Time. There are 26 double-bit axes completely immersed in the salt bath

The tempering bath is operated at a temperature of 580 deg. Fahr.; the vessel is 12 in. by 46 in. at the top, and 12 in deep. Its electrical capacity is 57 kw.

Coils in each furnace are divided into two equal circuits, each operated by separate contactor switches, which are opened and closed by means of temperature recording and controlling pyrometers.

Two thermocouples are used with each furnace, one of the protected type plunged in the bath; the other is bare and placed within the heating chamber. This double protection and control is necessary to protect the heating elements fully against excessive temperatures, particularly during the heating up periods, and to maintain the bath temperature constant within 7.5 deg. Fahr.

Theoretically, if a definite amount of heat be supplied each minute to a bath, it should be possible to put just enough work through it each minute to hold the temperature constant. Some means should be employed to indicate whether or not the operator was working at the correct rate. This may be accomplished by placing three contacts on the pyrometer, operating three lamps. A white light would indicate correct temperature; a blue light, temperature too low; a red light, temperature too high; a white and blue light, a downward swing in temperature; a white and red light, an upward swing in temperature.

In practice, it is impossible to comply entirely with the theory above outlined. For one thing the weights of axes vary, consequently the rate of heat absorption is not constant. This condition necessitates a furnace having a capacity sufficient for heating the largest charge at the given production rate, and, as a factor of safety, an excess capacity for unforeseen contingencies. The temperature variation of this combined system under the worst conditions was sufficient to hold the hardening temperature within 15 deg. plus or minus. In order that the signal system noted above should burn continuously, and not intermittently, it was necessary to use two recording and controlling instruments, one for the bath and one for the heating chamber.

The use of two control instruments, two separate contactor switches and two circuits in each furnace opened the way for an investigation for further refinement of temperature control. Temperature surges had been reduced from 30 deg. to 20 deg. by controlling the temperature of the heating zone. If the amount of energy necessary to control, on and off, intermittently, could be reduced, the corresponding surges in temperature would

DOUBLE-BIT Axes Are Being Heated in the Electrically Heated Lead-Hardening Furnace. The bit only is immersed in the lead. Note the three lamps on the wall at the extreme right, with the white light showing, indicating proper temperature and correct rate of production. The brine quench tank is directly back of the furnace operator. After finishing the day's production, the rack for holding the axes in the bath is removed, and the insulated cover is placed in position over the lead bath, so that the lead is still in a molten condition next morning

be reduced. This was accomplished by taking one circuit of the furnace entirely off the recording control pyrometer for the bath and placing it on the control pyrometer for the heating chamber, with the net result that one-half of the furnace capacity was in constant service and one-half in intermittent service.

Whether one circuit or both circuits are on, they are at all times under the control of the heating chamber thermocouple and pyrometer, cutting off the current entirely should the temperature of the heating chamber rise to a predetermined point, and cutting it on again as the temperature is lowered. With this scheme, the temperature fluctuation was reduced to 7.5 deg. Fahr. plus or minus.

Furnaces never cool sufficiently to freeze the bath, except during the week end. Heavily insulated covers are provided which, at the end of the day's run, are lifted from their stand by a chain hoist, and lowered over the furnace. Cooling over night (15½ hr.) lowers the temperature of the lead 500 to 550 deg., and this is recovered in about half an hour in the morning. The tempering furnace cools over night from 580 deg. (the operating temperature) to about 450 deg., but is reheated in 20 min. In either case, an equal amount of time is given the furnace to equalize the temperature thoroughly, before heat treatment starts.

In the hardening bath, 23 axes are suspended, point down and immersed in the lead bath up to within one inch of the hole for the handle. On top of the molten lead is placed a blanket of granular carbon, which has the effect of reducing the radiation losses, reducing oxidation of the lead, and wiping lead globules from the hot axes when removing. After the axes have been in the bath a definite length of time they are removed, quenched in brine, rinsed in clear water, and are ready for tempering. This work is done in rotation—taking one axe out, quenching it, replacing it in the hardening bath with another, removing the next, and so on.

With 4-lb. single-bit axes, 5 min. is allowed for this complete cycle, permitting the operator to work at a very comfortable pace, without hurrying. With 6½-lb. axes, an 8-min. schedule is required for 23 axes.

Operation of the tempering furnace is substantially the same as the hardening furnace, except that the entire axe is submerged in the liquid, and a double-bit axe requires only one tempering operation, whereas it is run through the hardening furnace twice, once for each blade. Tempering 4½-lb. double-bit axes, both points at one time, the length of time any one axe was in the bath was 8 min. The tempering bath holds 26 double-blade axes, or 29 single-blade axes by the changing of the jig.

One operator is required for each furnace, working on piece work, each man turning out 1450 axes a day. Two men and the electric furnaces turn out a larger production than five heat treaters previously turned out of the fuel-fired furnaces, are not rushed as they were in the past to average a certain wage per day, and have better working conditions.

Maintenance Costs

Maintenance of the gas furnaces was amazingly small ($14.90 a month) due to the simple construction of the furnaces, and to the fact that the heat-treaters supplied most of the labor at no cost, since they were on piece work.

No expenditures for repairs to the electric furnaces have occurred to date, but the vessel of the hardening furnace will have an average life of 6000 hr. Tempering vessels have been in use for 13,000 hr. with no signs of depreciation. If a vessel costs $800 installed in the furnace, and is used 200 hr. per month, the monthly depreciation is $23.20. Two hundred eighty lb. of lead and 28 lb. of tin are used each month in the hardening bath to make up the loss of metal, which amounts to $31. One ton of granular carbon will last 9 months, and costs $50 delivered. Average monthly cost is therefore $5.60.

One barrel of special tempering salt costs $75 and lasts three weeks. This item amounts to $100 a month.

Recapitulating the total maintenance per month for the two electric furnaces is:

Vessel	$23.20
Lead	31.00
Carbon	5.60
Salt	100.00
Total	$159.80

"Slush Molding"—What It Is and How Conducted

RECENTLY an inquiry came to THE IRON AGE as to what "slush molding" of cast iron is. There is no allusion to it in the literature and questions propounded to a number of foundrymen were without results. Finally, however, an answer was obtained.

Slush molding is nothing more than the well known method of making zinc statuary applied to cast iron. When a statue is cast, the mold made with the pattern has no core. After molten zinc is poured into the mold, it is held until a coating against the walls, about ⅛ in. thick, has set. By turning the mold upside down the remaining molten zinc is poured out. This leaves a hollow statue, which is bronzed and sold for genuine.

This method can be successfully applied to cast iron, but not to aluminum. In making a kettle, for example, no core is used but the molten iron is poured into the mold, allowed to stand just long enough so that the desired thickness of metal sets against the mold surfaces, after which the still molten iron is poured out. Several kettles can be made with the remaining iron so long as it is sufficiently hot. The time allowed for hot or cold metal would be a matter of experience.

The whole process depends upon the rate of cooling of the molten metal in contact with the green sand of the mold and with comparatively cold and damp mold walls. It is also essential that the metal have a fairly wide range of temperature from the liquid to the solid state. A rich gray iron has this when high in silicon. In the case of aluminum the metal sets practically all at once and slush molding cannot be employed.

Measuring Open-Hearth Temperatures Accurately

ONE rather surprising fact in connection with gas temperatures in the open-hearth furnace, has recently been reported by A. Schack in *Stahl und Eisen*, 49 (1929), pages 1196 and 1197. This is that in five different furnaces the upper limit of temperature in the outgoing gases at the ends of the furnaces is no higher than 1610 deg. C. (2930 deg. Fahr).

Measurements were made with the "Durchflusspyrometer," a thermocouple so arranged that a stream of gas is drawn rapidly over the hot junction, thus minimizing errors due to radiation from surfaces hotter or colder than the gas.

Temperatures of outgoing gases measured in this way at the top of the checkers were some 120 to 150 Fahr. hotter than those obtained with the ordinary couple. With incoming air, at the same location, the "true" temperatures were from 180 to 270 deg. Fahr. lower than those found by usual procedures.

Unusual Uses of Magnets in Handling Materials

WHILE electric magnets have for some years been standard equipment for handling scrap, pig iron and many other items of iron and steel, both in steel mills and foundries and in scrap yards, there are a number of uses to which magnets have been put in some plants which may suggest other uses to other plants. Some of these out-of-the-ordinary practices are shown in pictures from the Ohio Electric & Controller Co., Cleveland.

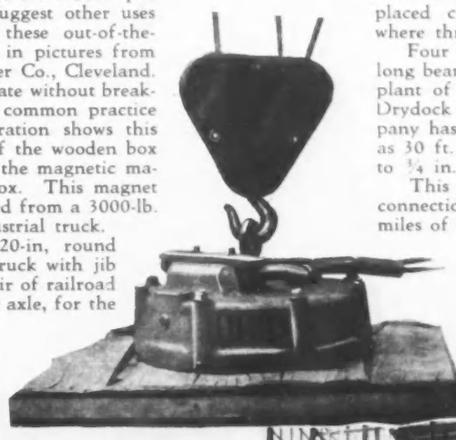
Picking up a box of tin plate without breaking out contents has become common practice in some plants. One illustration shows this operation wherein one side of the wooden box lies between the magnet and the magnetic material contained within the box. This magnet 18 in. in diameter is suspended from a 3000-lb. jib crane on an electric industrial truck.

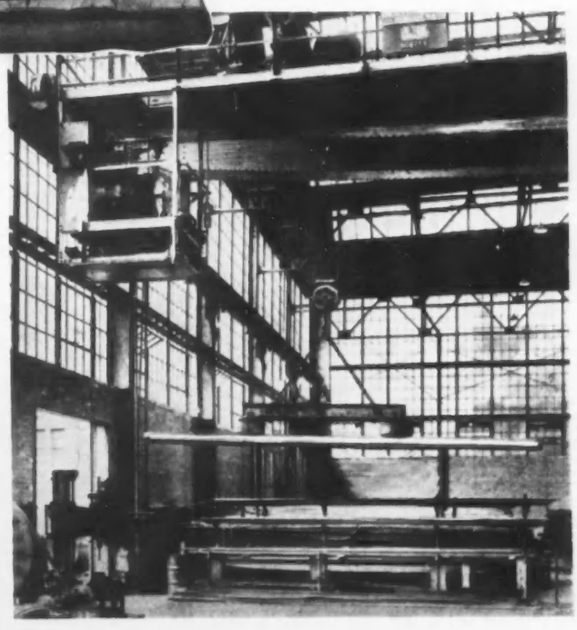
Another view shows a 20-in. round magnet, also on an electric truck with jib crane attachment, lifting a pair of railroad carwheels with the connecting axle, for the Indiana Harbor Belt Railway at Indiana Harbor, Ind.

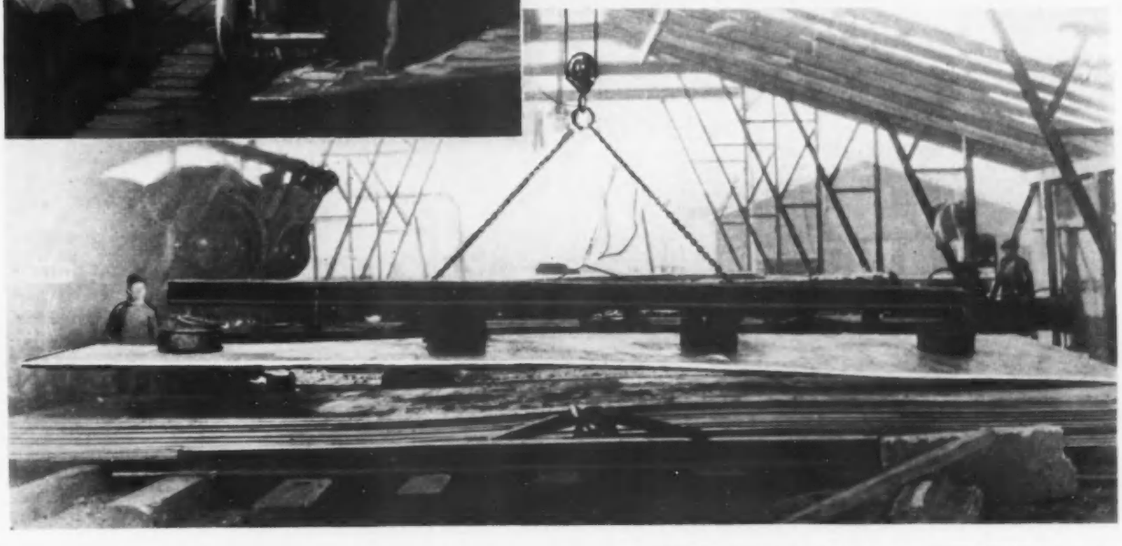
Two small magnets (20-in.) on a spreader-beam are used for handling pipe, as shown in a third illustration. These magnets will pick up about 900 lb. of pipe in several sizes and save time and labor in so doing. Space is saved also, because the pipe racks may be placed close together, without aisle space, where this method is used.

Four of these 20-in. round magnets on a long beam are used in handling plates in the plant of the Newport News Shipbuilding & Drydock Co., Newport News, Va. The company has six such sets, taking plates as much as 30 ft. long by 8½ ft. wide, and from ⅜ to ¾ in. thick.

This particular job was undertaken in connection with machining plates to form 90 miles of water pipe 6 ft. in diameter, for use in California. There were 5145 carloads of these plates to be handled. The magnets unloaded the plates, piled them, carried them from machine to machine and finally loaded them on shipboard.







Conveyors Reduce Factory Accidents

Growth of Mechanical Transportation, However, Has Created Special Hazards from Which Workers Must Be Protected

BY W. DEAN KEEFER*

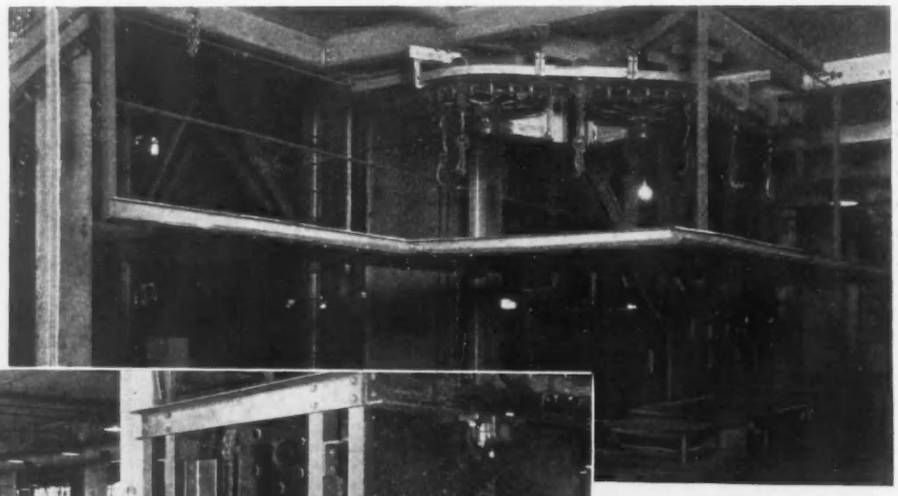
As related to industrial progress in metal-working plants, this might be called the age of conveyors, for the increased use of mechanical means of transportation has in large measure enabled the metal-working plants of the United States to make such pronounced world-wide production and efficiency records.

One of the most important benefits coming from the employment of conveyors is in lessening industrial accidents. Although conveyors are seldom installed wholly to prevent accidents, they usually replace hand labor, and this reduction in the working force tends to cut down the number of personal injuries because of the decreased man-hours exposure.

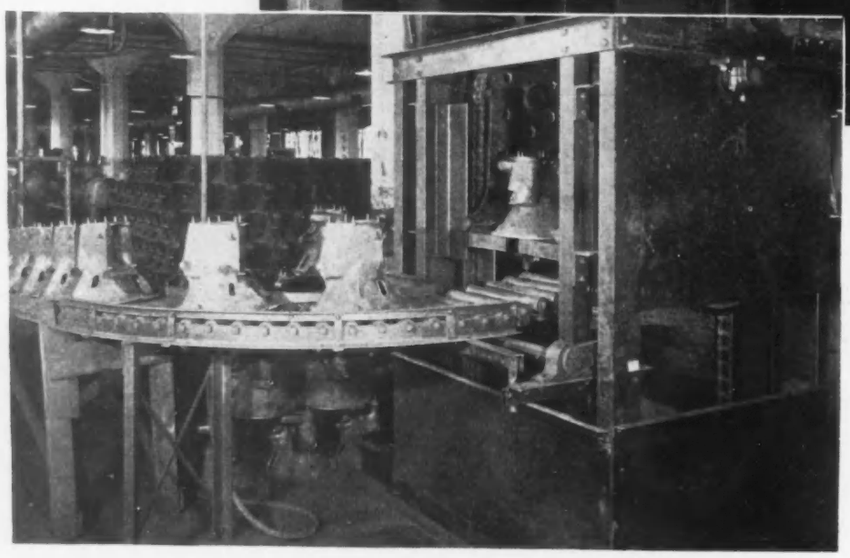
One reason why our modern factories have been able to effect such pronounced reductions in accidents is because of the displacement of dangerous operations by the use of conveyors. This is one form of engineering revision which has become closely associated with sound safety work. Fatigue, cluttered-up working places, congestion, irritating delays due to accidents and many other forms of industrial waste are being minimized by the engineering application of mechanical principles in handling materials.

However, mechanical conveying systems introduce special hazards which must be recognized, for the reason that accidents resulting from them are usually quite severe. A conveyor represents a mass of moving steel under the control of power. It is not surprising, therefore, that most injuries to men who become caught in conveyors are likely to be serious, probably resulting in broken arms or legs or a crushed body. For this reason no conveyor system can be considered complete until it is pro-

*Director, Industrial Safety Division, National Safety Council

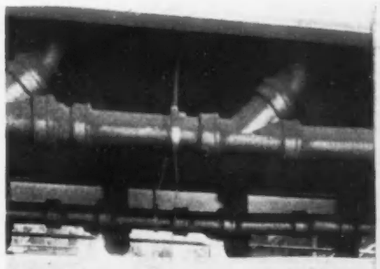


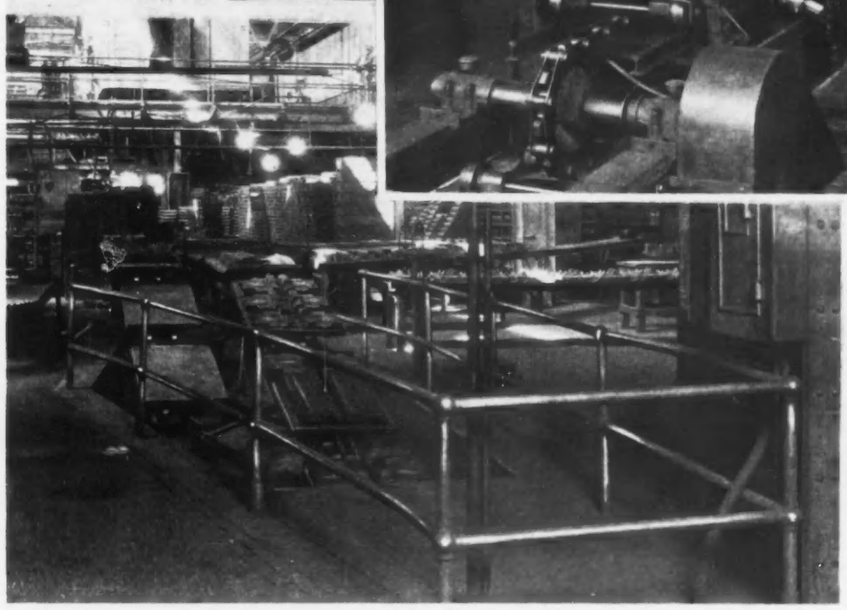
BASKET Guards Should Be Placed Underneath Overhead Chain Conveyors to Prevent Material from Falling upon Workmen (at Right)

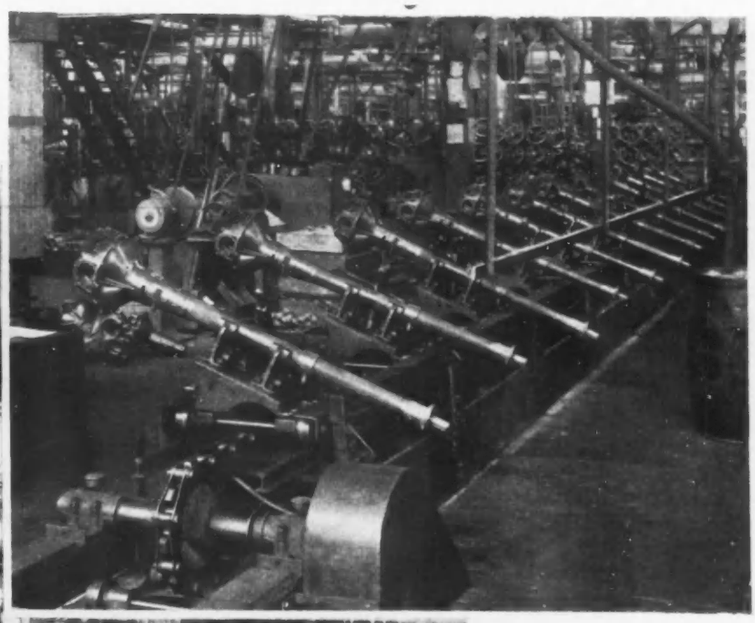


TRANSMISSION Cases Are Loaded On and Discharged from This Conveyor Automatically, Thereby Reducing to a Minimum the Possibility of Accidents to Employers (at Left)

RAIL Guards Protect Workmen at the Point Where This Core Conveyor in an Automobile Foundry Passes from One Floor to Another (Below)







ALONG This Chain Conveyor a Rail Guard Has Been Erected to Keep the Drive Shaft Housing from Flying Up and Possibly Hitting a Worker If the Chuck Holding the Axle Should Break or Fall (Above)

vided with every possible mechanical device for safety, to lessen such accidents and hazards.

Conveyor Hazards Discussed at Safety Meetings

Conveyor accident hazards are always important topics of discussion at regional and national safety conferences. For example, one of the outstanding addresses at the 1926 National Safety Congress was on "The Hazards of Assembly," by R. F. Thalner, safety director of the Buick Motor Co. He indicated as his experience that a large percentage of the hazards of assembly was in the use of conveyors. He listed them as hazards in transportation from machine shops to assembly plants, in sub-assembly and in main assembly. Under the latter he listed hazards with conveyor lines, chains, motive power and stop buttons. Additional hazards occurred in connection with appurtenances to conveyor lines, such as in frame-riveting, ventilation, furnaces and hammers and hazards with cables and their inspection, lighting, stock bins for small parts, belts and gears, steaming room, painting and drying, subconveyors, hoists, pit work, punches, drifts and chisels.

Mr. Thalner is of the opinion that conveyors are probably the most efficient and safest method for transporting stock, provided the equipment is properly installed.

Conveyors which require attention only at the loading and unloading ends eliminate to the highest degree possible the human factor, because in the entire process of transportation the only help required is in feeding the conveyor and removing the stock when it has reached the assembly line. Some additional help must be employed to maintain the equipment, "but this," as Mr. Thalner states, "is usually of a higher caliber than ordinary labor and consequently can be relied upon to protect itself. Proper mechanical safeguards over gears, chains and belts, as well as a number of stop stations along the conveyor, will make this equipment almost 'fool-proof.'"

As another protection for a conveyor system, the motor equipment should be completely inclosed. This is needed not only as a safety precaution, but also to protect the system from possible damage, for shutdowns are always costly.

Repairs Should Be Made While Conveyor Is Stationary

It is a good safety rule that no adjustments or repairs of any kind on a conveyor system should be made while the conveyor is in motion. Through the use of modern pressure oiling and greasing devices, however, the oiler may be able to reach out-of-way places without special hazards. Extension pipes on oil and grease cups are also a good protective device. Automatic gravity oilers are in wide use, and a central oil reservoir or container is not only economical but removes accident hazards.

Conveyors should not be started without first giving warning to the men who may be making repairs or adjustments or oiling the machinery. Every repair man should be provided with a lock or a warning sign, which

he should put on the starting lever or control switch before starting his work on the conveyor. Rules forbidding anyone to remove a lock or a warning sign, except the person who placed it, should be rigidly enforced.

In the case of long conveyors running through two or more rooms, or in one room to points from which controls or lever cannot be seen, it is sometimes a good plan to provide a gong or a whistle to be sounded by the operator about a half minute before the machinery is started, thus giving warning to anyone who may happen to be in a position of danger.

National Conveyor Safety Code Being Formulated

The problem of protecting conveyors is considered of enough importance to demand a national conveyor safety code. Such a code is being worked out under the auspices of the American Standards Association, with the American Society of Mechanical Engineers and the National Bureau of Casualty and Surety Underwriters as sponsors. Twenty-eight groups and organizations, with 42 special representatives, are cooperating in formulating it. These organizations include the American Society of Safety Engineers, American Foundrymen's Association, American Railway Engineers Association, International Belting Conference, National Safety Council, Society of Industrial Engineers, United States Bureau of Standards, factory representatives and other like groups. Their purpose is stated as follows: "Safe operation and maintenance of gravity, belt, chain, flight, bucket, apron, screw and jigging conveyors, car hauls, aerial cableways, overhead trolleys and pneumatic tubes."

Safety in the use of conveyors is closely associated with safe practices with belts and belt guards, shafting, coupling, pulleys, gears, sprockets and chains. Hooks and chains should often be inspected. Electrical equipment also is important. There are many possible hazards in switches, through control stations, from wiring, and in points where limit stops are made.

Proper methods of securely fastening overhead carriers of different sorts are also important, and wire ropes and cables should be frequently inspected. There are special hazards at regular cross-over points of conveyors, unless protected by elevated bridges or tunnels with proper guard rails. There is always danger in the practice often seen in factories of boys and other workmen riding on certain kinds of conveyors. Such a practice should be strictly prohibited; it usually can be done by the establishment of guard rails at proper points.

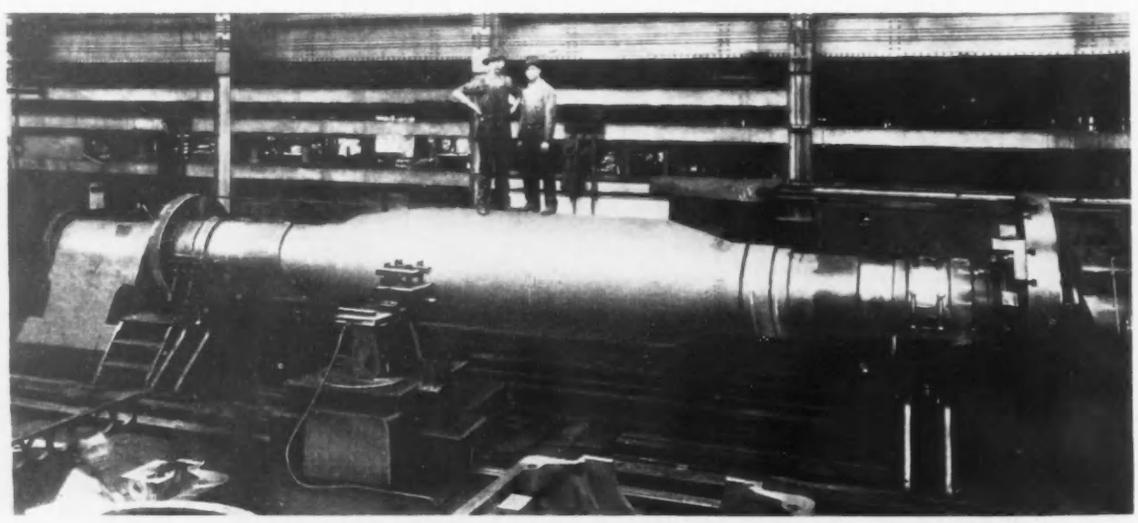
The Chevrolet Motor Co. has made novel use of one of its overhead traveling conveyors to carry safety messages. This conveyor travels slowly and safety signs are so arranged as to appear about every 5 min. at a given point. "Even a busy bee uses safety" is one of these slogans. Others are: "The safe way is the best way," "Safety ways prove safety pays," "Safety ways bring happy days," and "Today is safety day."

Many factory accidents are due to falls and therefore it is suggested that loading and discharging stations of conveyors be protected with anti-slip floor surfaces.

Overhead Conveyors Need Special Protection

The efficiency of many small plants has been greatly increased through the addition of suitable conveyors, many of which are of the overhead type. These conveyors demand special protection with nets or flooring underneath them. Where there is such overhead flooring there should always be foot-boards, guard-rails, and the like, to prevent material from falling.

Extension of conveyors from one floor to another has introduced a special fire hazard, permitting a fire, unless there is proper protection, to spread quickly between floors. Two methods have been devised to eliminate this hazard —one to inclose the chute in a tower of steel, concrete or masonry and the other to provide fire doors (draft checks) where the chute passes through the floors.



THE shaft shown in the accompanying illustration weighs 140,000 lb., with a maximum finished diameter of 53 in. and an overall length of 32 ft., and is thought to be one of the largest ever built. It was forged by the Midvale Co., Nicetown, Philadelphia, from an octagonal ingot about 82 in. in diameter and weighing 290,000 lb., and was machined in the shops of the Westinghouse Electric & Mfg. Co., East Pittsburgh. It is designed to be supported with the rotor on two large bearings, 30 in. in diameter and 60 in. long. The shaft will be used in the rotating part of a 60,000-kva. 514-r.p.m. horizontal generator in the Westinghouse company's test laboratory.

Possibilities of High-Test Cast Iron

Need of Classification and Proper Test Bars— Use of Alloys and Special Melting Processes

HIGH-STRENGTH cast irons offer possibilities to the gray iron foundryman not only to increase his field of operations but also to regain some of the types of work now being placed in other iron and steel groups. An essential point to be remembered is that, in the present condition of development of high-strength cast iron, this material is still in the experimental stage, and, further, as it develops, it will be necessary to classify or grade cast irons according to their merits, said E. J. Lowry, consulting metallurgist, Detroit, in a paper, "High-Strength Cast Irons," presented at the National Metal Congress, Cleveland, in September.

European investigators have perhaps been more forward in the development of this material than our own research and production men, said the author. This no doubt is due to the fact that American foundrymen are faced with the problem of mass production, whereas in Europe more time can be given to technical developments of processes surrounding the production of cast iron of new physical properties.

Various Types Should Be Classified

When one considers the nomenclature, "high-test cast iron," it is apparent that the cast iron industry has not taken full recognition of the possibilities existing in the industry. Instead of departing from empirical standards, it is continuing in the same vein. It is essential that the varying types of cast iron be properly classified. This is apparent when one considers the trade name "semi-steel." This term will allow a foundryman to make his product with as low as 1 per cent of steel in his mixture and as high as 100 per cent steel melted in his cupola. This cannot be taken as a condemnation of the product, but merely shows the latitude with which this kind of cast iron may be made.

Another illustration is afforded by the case of alloyed cast irons. In this instance claims may be made where alloys are used but no full percentage is given. It must be admitted that it would not be an easy task to classify cast irons under such methods as the S.A.E. uses in designating various types of steel for definite uses, for cast irons are more complicated in their structure, physical and chemical analyses than are steels. If, however, the engineer is to be enlightened, cast irons must be categorically named for him with subsequent listing of what might be expected in cast irons in these classes.

Quite often the engineer is guided solely by text books with an exception here and there of actual experience. It is often the case that data in text books are based on assumptions of strength obtained under varying circumstances 20 years ago. They further are based on inaccurate determinations in comparison with those made today. It is quite usual that engineering text books quote the tensile strength of cast iron as a maximum of 14,000 lb., and more usually at 12,000 lb. per sq. in. Such physical properties are ridiculous on their face value unless the specimens were cut from 2½-in. sections made from analyses of too soft a chemical composition. As an instance, keeping the section the same and using a different silicon analysis, the strength may be dropped from the range of 25,000 to 13,000 lb., when the silicon is raised from 0.75 to 2.25 per cent. It is obviously quite wrong to judge cast iron at a 14,000-lb. strength when by ordinary practice 25,000 lb. can be readily obtained.

Test Bar Needed Which Can Be Correlated

Test bars mean very little under their present acceptance. Their use is limited to comparisons for the physicals obtained by varying the analyses and the irons used in mixtures. They cannot be used to mean the actual strength of a casting. This leads to doubt by the engineer. Therefore, there is an immediate necessity for the development of a test bar which may easily be correlated to the physical properties of a casting. When this is accomplished it will be easier to understand the action of new processes developed.

Production of high-strength cast iron by the use of alloys has long been known, but to produce strengths of 60,000 to 65,000 lb. per sq. in. has led to the use of special melting processes with the subsequent addition of alloys. Such methods have not generally been accepted by foundrymen. It must be realized that a change of method requires courage, whereas a simple method of introduction of alloys could be generally accepted. Any change in the method of melting requires a revising of the usual production processes.

It has been generally thought that alloys may be introduced into inferior irons with the resulting effect that high-strength cast irons will be produced. Such is not the case. Alloys act merely as an aid to the betterment of a condition. When alloys are properly used in connection with correct section and analyses, it becomes a fairly easy matter to produce high strength without special processes. This means that when a foundryman has adjusted mixtures, he can use regular cupola metal and, with the addition of one of the known alloys, increase his average strength from 28,000 lb. to 45,000 lb., and even as high as 65,000 lb. per sq. in. The known alloys are nickel, chromium, molybdenum, vanadium and titanium.

Special Melting Processes

Too little attention has been paid to methods of procedure and basically so because of the apparent initial cost. When, however, one considers the use of special melting processes, plus the use of alloys, in comparison to a combination of alloys with regular iron, the resulting costs are apparently the same. It is easier to work with the latter method than to apply the former in production foundry work.

There are still further possibilities in the production of high-strength iron when the question of annealing is considered. A process may allow a casting to be made harder and stronger. By proper annealing the hardness and strength are little affected and yet the machinability is increased to the point of the lower strength, softer cast iron. Continued experiments with varying analyses and later heat treatments offer great possibilities for the production of high-strength cast iron.

World's Largest Nitriding Furnace

Over Two Tons Can Be Treated with Ammonia Gas—Products 11 Feet Long Hardened in It

AMONG recent developments in the process of hardening steel with ammonia gas or nitriding is the construction by the Central Alloy Steel Corporation, at its Canton, Ohio, plant, of what is said to be the largest nitriding furnace in the world.

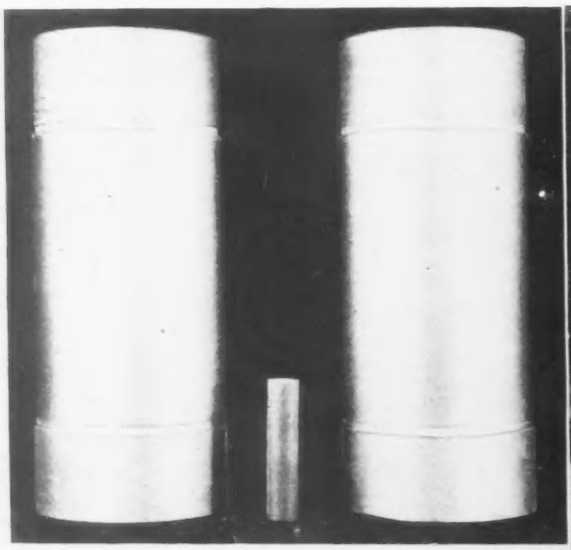
The plant was built for nitriding large parts. It is a 580-kw. double-end car-type furnace. The heat control is separated into three sections—the two ends and the middle, the heating elements being located in the bottom and at the sides. The furnace is designed for operation at temperatures up to 1800 deg. Fahr. to permit its use as a quenching and drawing furnace as well as for nitriding.

The furnace is 26 ft. long between doors, with an effective length of 24 ft. It is 5 ft. 9 in. wide and has a loading clearance of 4 ft. 8½ in. The nitriding box is 22 ft. long, 34 in. wide and 30 in. high. It is mounted on an 8-wheel motor-driven car.

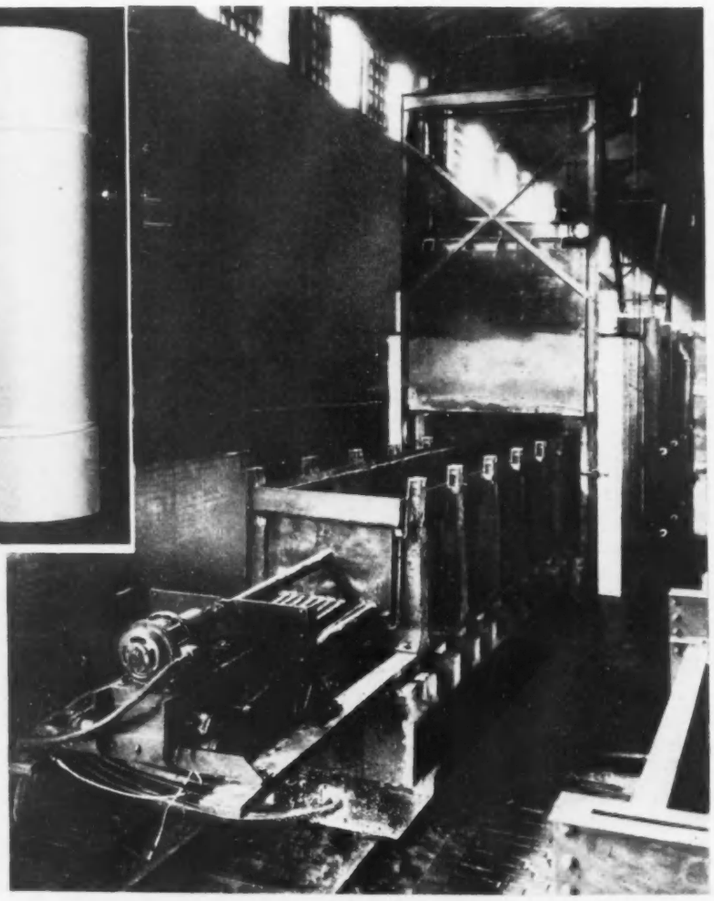
The nitriding box is of welded construction, the joints necessarily being gas tight. It is made of KA2 stainless iron sheets. The cover is sealed by tin, lead and bismuth, metals that melt at low temperatures. A platform of three 1½ x 4-in. strips running lengthwise is built up in the bottom of the box to support the material being nitrided, as it is necessary to have the work well supported to avoid warpage. Other strips, ¾ x 4 in., are placed across the longitudinal strips, which are of plain carbon steel.

The box rests on cast steel cradles which are bolted to steel slabs extending lengthwise. The slabs rest on sand covered bricks that are laid on the car platform, the sand taking care of the difference in expansion between the brick and the slabs when the box is being heated.

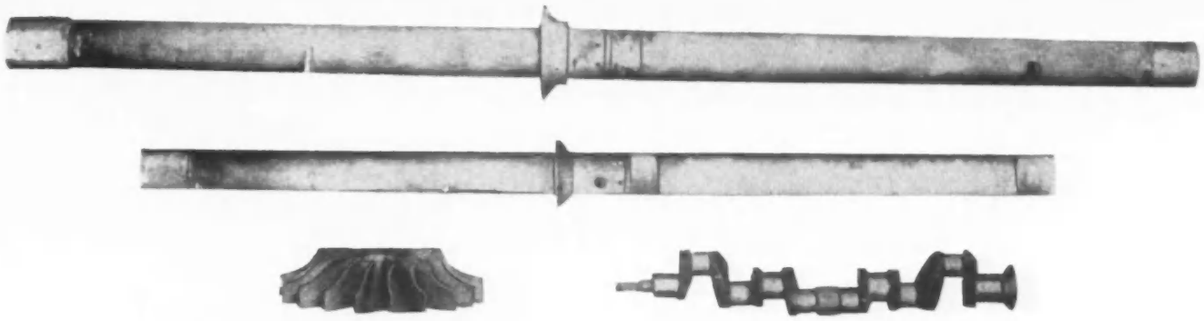
Ammonia is delivered from five tanks to a bustle pipe and from that to two outlets, one for connection to the box when it is outside and the other for connection when it is inside the furnace. Connection from these outlets to the box is through heavy rubber tubing that connects to a bustle pipe. This pipe feeds five ½-in. tubes made of KA2 tubing that serve as inlets. These pipes extend through the end of the box in the bottom of the box and are of different lengths, their discharge ends being 4 ft. apart permitting the distribution of the gas through the



Some Large Cylinders (Above) Which Have Been Nitrided



THE Large Nitriding Box (Right) Before Being Pushed into the New Nitriding Furnace



Some Large Sections Which Have Been Nitrided. The two upper products are large piston rods for a gas engine. An impeller and a crankshaft are the other two products

box. Three 1-in. outlets provide sufficient outlet for the gases leaving the box and to take care of the back pressure. These outlets connect with a bustle pipe and from this the gas mixture passes into three other outlets which feed into water bubblers. The extent of the ammonia dissociation is determined at the outlet before the gas enters the water bubblers.

A feature that is unusual is a fan located in the box to insure the circulation of gas through the work. This is direct driven by a motor mounted on the car and connected to a shaft running through a tube into the box. Because of the high temperature, the bearings supporting the fan cannot be lubricated.

A combination of steels of extreme hardness, heat-resisting and non-corrosive, all working in a loose fit, is used to take the place of lubricated bearings. The driving shaft is of Enduro-KA2 steel. The sleeve is of nitralloy and the bushing of a heat-resisting alloy. The temperature control is by pyrometers in the roof of the furnace. For checking purposes there are also two pyrometers in the nitriding box.

The work is cleaned before it is placed in the box, making it as free from scale as possible. Then the lid is placed on with a crane and the car runs into the furnace under its own power, the end of the car carrying the motor remaining outside the furnace. When the car is in the proper position in the furnace the open end of the furnace is bricked up before the heat is turned on.

The nitriding temperature in 975 deg. Fahr. Work is kept in the furnace from 50 to 90 hr. Ammonia is introduced when the seal melts or at about 300 deg. Fahr. causing the cover to seat. It takes from one hour to 90 min. to drive out the air after the box is sealed and 5 to 6 hr. for the furnace to reach temperature. After the heat is turned off the work is allowed to cool down to about 800 deg. before being taken from the furnace. After the car is taken out, the parts are allowed to cool to about 300 deg. before the lid is taken off the container. The work comes out with a silver white finish.

The largest furnace charge to be nitrided so far is 2 tons. However, it is expected that the furnace would work satisfactorily with a larger amount of work in the box at one time. Work that has been nitrided in this furnace includes a shaft 11 ft. long and 6 in. in diameter, locomotive cross head guides, crank shafts for motor buses and piston rods and piston pins for gas engines. The maximum depth of case is 0.035 in.

The nitriding box, car and auxiliary equipment were built in the Central Alloy plant. The furnace was built by the Electric Furnace Co., Salem, Ohio.

Failures in the Brazing of Steel

TWO general methods for joining thin-walled steel tubes are in use, according to W. Riede in *Stahl und Eisen*, 49 (1929), pages 1161 and 1162. These are the torch-brazing process and the dipping process. Objection to the first is mainly on the ground that the flame melts the steel, while the second, although entailing a certain amount of extra finishing labor, appears more rational and with the exercise of care, will give uniform results.

In the dipping process, however, cracks appear in that part of the steel which has been exposed to the brass. This appearance is quite the general rule, but may be diminished by suitable aging and heat treatment.

As a result of experimentation, the following explanation is offered: Steels, which have been subjected to severe cold work, tend to recrystallize strongly when subjected to the heat of the brazing liquid. Internal stresses thus set up, accompanied by penetration of the brass between the large newly-formed grains, are the cause of the cracks.

It is recommended that the brass be kept below 1100 deg. C. In order to detect the intrusion of brass into the intercrystalline spaces a polished section is etched 3 min. in ammonium hydroxide; this shows the brass as a deep block. The grain boundaries are then brought out in the usual way with a 2 per cent solution of alcoholic nitric acid.

Much Nickel Used in Radio Tubes

ADVANTAGES of nickel for screens and plates in the screen grid tubes or other radiotrons are enumerated by C. C. Colby, Westinghouse Lamp Co., Bloomfield, N. J., writing for *Inco*, Vol. IX, No. 2. It is pliable, and the mesh can be readily formed into any shape desired; it is easily cleaned by baking in a hydrogen atmosphere, and is relatively immune to tarnishing on standing or handling; it can be readily spot-welded to other nickel parts; it has a relatively high melting point and it can be secured in a pure state at a reasonable cost.

The use of nickel mesh is restricted to the outer element of the tube for several reasons. The two grids within the plate are of comparatively small diameter, must be accurate in diameter, and if made of mesh would have to be of very open weave. Under these conditions, a more satisfactory grid can be manufactured using a spirally-wound wire than using woven mesh. In order to obtain satisfactory operation, the plate of the tube would have to be of very fine woven material if mesh were used; because of the difficulty and cost of weaving such fine mesh, solid nickel strip is still used for the plate.

In general, it may be said that every metal part within the glass bulb of the radiotron either consists of nickel, contains nickel as an alloying material, or is mounted upon nickel supports.

Efficient Wire Enameling Unit

Vertical Electric Tube Furnace, with Efficient Feed Mechanism and Temperature Control, Speeds Output and Improves Quality of Finished Wire

BY CHRISTIAN E. RUGH, JR.*

PRIME considerations in the enameling of wire is either to produce a satisfactory coating with decreased production costs or to apply a superior coating at the same cost. To achieve both of these objectives at the same time has been found commercially practical with the electric oven.

An extreme variation in varnishes and enameling procedure makes a fair comparison of different types of ovens a difficult matter. In comparative tests on two ovens, one gas and one electric, the results were judged solely upon the ability of each method to produce wire that would pass rigid inspection. A varnish that was considered satisfactory in a gas oven was used for both runs. Adjustment of temperature, speed of wire and ventilation were determined for each oven separately in order to produce a high quality of finish on the wire.

The type of electric oven used in these tests is the subject of the accompanying pictures, although the oven illustrated has 50 per cent more capacity than the oven actually used for the test. The ovens have an overall height of 22 ft. Take-off mechanisms and feeder spool racks are attached to both sides of the oven. The method of dipping the wire in the enamel is also shown.

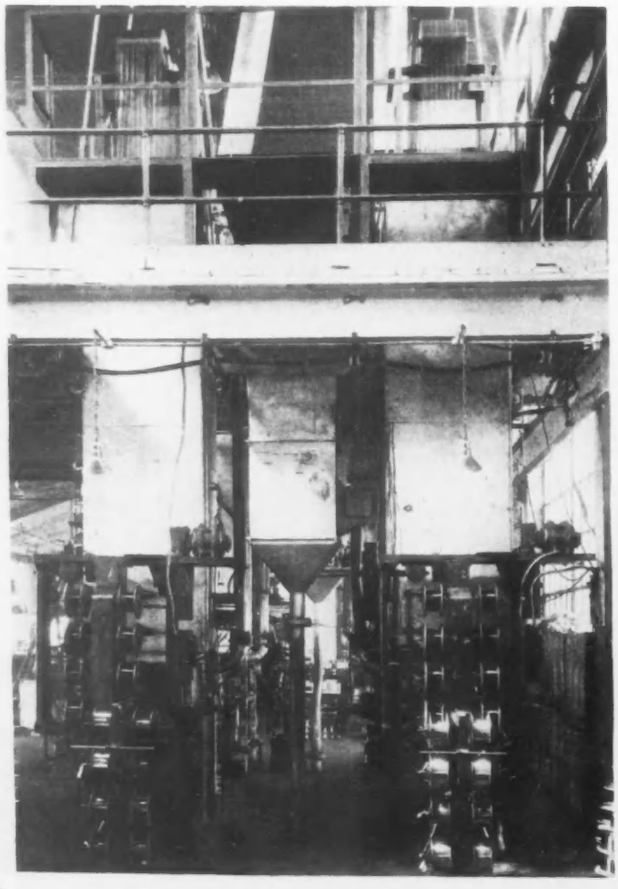
Table I shows the result of the experiment conducted on the two different types of ovens. The same size wire was run in both cases and it was taken at random from factory stocks.

Gas used in the test was 550 B.t.u. gas and the purchase price was 80c. per 1000 cu. ft. Electricity was purchased at 1c. per kwhr. Taking into consideration the increased speed that could be obtained in the electric oven, the cost comparison becomes 0.445c. per 1000 ft. of finished wire in the electric oven as against 0.815c. per 1000 ft. of finished wire in the gas oven.

On another occasion and in a different plant, a comparative test on 28.5-mil copper wire run at a speed of 22 ft. per min. showed the results given in Table II.

Gas in the above case cost 72c. per 1000 cu. ft. and the

*Industrial Heating Engineering Department, General Electric Co.



ELECTRICALLY Heated Vertical Ovens for Enameling Wire (at Left)

* * * * *

WIRE from Spools Passes Under Grooved Sheaves Which Dip into Liquid Varnish. More than one coat may be given by looping the wire back outside the furnace and around this sheave as many times as desirable (Below)

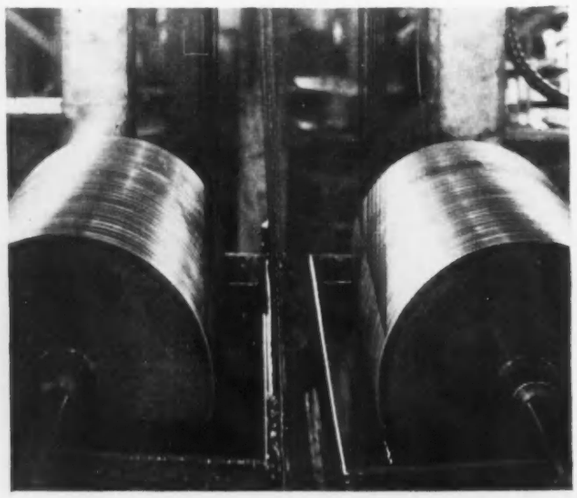
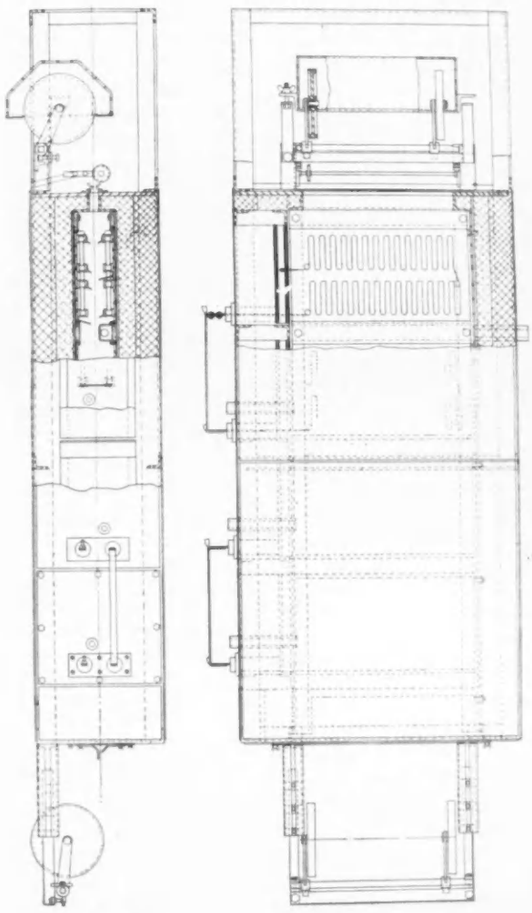


Table I.—Comparative Production of Electric and Gas Ovens

Oven	Bare Wire Dia. in Mils	Insulation Limits in Mils	Speed in Ft. per Min.	Fuel Consumption per Hour	Fuel Cost per Hr. in Cents
Electric	25.5	1.2 to 2.1	25	8 kwh.	8.00
Gas	25.5	1.2 to 2.1	22	160 cu. ft.	12.80

In both cases, the number of wires through oven was 48; the number of dips, 4, and the number of heads, 12.



VERTICAL Oven Is a Narrow Rectangular Slot Through Which Wires Are Threaded. Air circulation for oxidizing the varnish and carrying heat from resistors to wires is insured by baffles on inside walls (not shown)

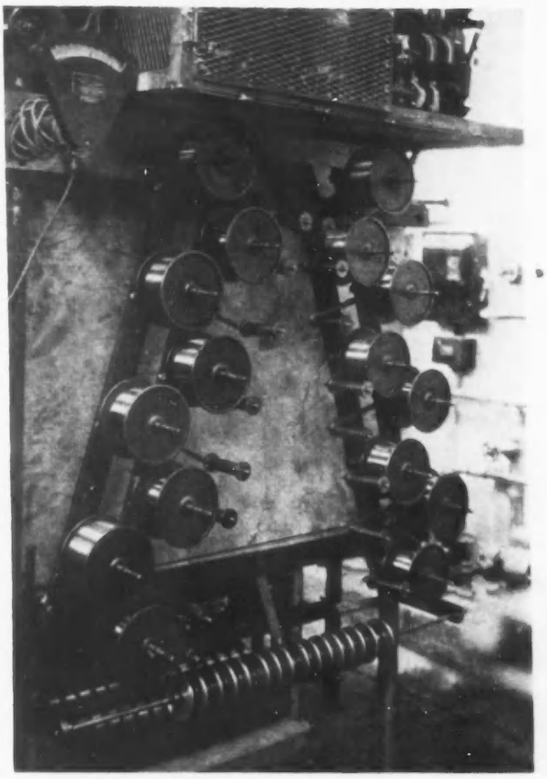
electric rate was 1¼c. per kwhr. The electric load was so desirable that a rate of ¾c. per kwhr. was made for complete electrification of the enameling plant. This lowered rate figured to a net saving of $500 per oven per year on fuel alone.

The characteristic design of an electric wire enameling oven shows that the wire is fed from spools arranged on a suitable rack mounted to the back of the oven. To

Table II.—Comparative Cost of Insulating Copper Wire

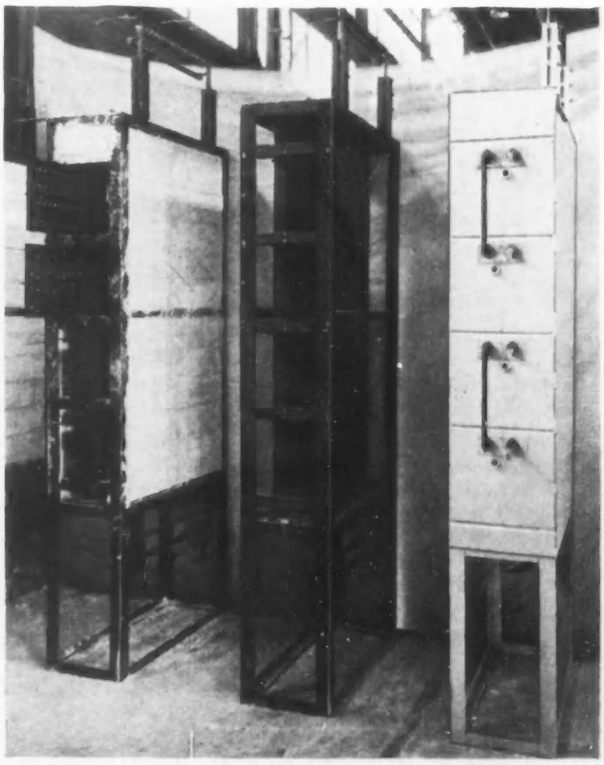
Oven	Bare Wire Dia. in Mils	Insulation Limits in Mils	Speed in Ft. per Min.	Fuel Consumption per Hour	Fuel Cost per Hr. in Cents
Electric	28.5	2.6 to 4.4	22	6.8 kwh.	8.54
Gas	28.5	2.6 to 4.4	22	178 cu. ft.	12.80

Number of dips, 8; number of heads, 6; wires through oven, 48.



ARRANGEMENT of Feeder Spool Rack and Control Panel Is Compact

SECTIONAL Construction of Electrically Heated Wire Enameling Ovens. Skeleton framework shown at center; unit heating plates and refractory walls installed at left; completely cased oven at right



anneal the finer sizes of hard drawn copper, the wire is passed under small guide sheaves and up through the oven without being dipped in enamel. The wire then passes down the front of the oven to a sheave having four grooves and dipping into the enamel. In going through the enamel, the wire picks up a thin film that flows out evenly as the wire passes into the oven. The wire is looped up and down in this manner four times and gets as many separately baked coats of enamel, of required total insulation thickness.

The distance of both bottom and top sheaves from the oven can be varied. The bottom sheave must be placed so that the enamel will flow out smoothly along the wire before reaching the heated chamber. The top must be far enough away to allow the enamel to thoroughly cool and harden before being run over the sheave.

Heating units are made of high heat resisting alloy and are so shaped as to give very efficient heat transfer to the air. Units are mounted on metal plates, suitably insulated as shown, and are removable through the side of the oven making the entire heating chamber accessible.

Quality of product is much improved by use of the electric oven. In one enameling plant the old standards required the wire to be bent around a mandrel four times the diameter of the wire without cracking the varnish coat. The specifications now call for the same test around a mandrel three times the wire diameter. It is not uncommon to take samples of electrically enameled wire from production spools and bend them around their own diameters without noticeable cracking.

A similar inprovement was found in the continuity of the varnish film on the wire. Standard requirements call for not more than 15 breaks per 100 ft. when an electric potential is placed between the wire and a mercury bath through which the wire is run. (Voltage varies with the size of wire.) Long-production runs have shown that electrically enameled wire consistently runs less than 10 breaks per 100 ft.

Other standard tests such as dielectric strength, hardness of enamel, flexibility, oil immersion and thickness showed the electrically enameled wire to run regularly well within the limits established under other methods of enameling. Reasons for these exceptional economies can be traced directly to the inherent characteristics of electric furnaces and ovens of sound design. The design is the result of extensive experience in adapting electricity to industrial heating problems.

The compact arrangement that may be effected with the electric wire enameling oven is obvious from the various illustrations. The base plate covers 12 sq. ft. and up to the height of an average man there is no overhang. The projected floor space occupied by the oven, pick-up mechanism, feeder spool rack, oven control panel, transformers and vapor condenser is 20 sq. ft.

Heat regulation is of particular importance and the arrangement of heating units compensates for losses at the points where they occur. Thus the temperature distribution within the oven is remarkably uniform. The design of heating units can also be such as to increase the temperature along the height of the oven at almost any desired rate and hold it constant at any set value. For such purposes a "high-low" power control has definite advantages. The high heat is adjusted to supply slightly more than the normal power requirements and the low heat, to supply slightly less. Any changes in temperature then take place very slowly, enabling the control instrument to function with a very slight lag behind the actual temperature change, and makes it unlikely that the temperature at other points than the control pyrometer will vary from the limits set upon the controlling device.

Coincident with the baking process, the varnish oxidizes, i.e., undergoes a chemical change. The importance of this phase of the operation emphasizes the advantages of the electric oven quite clearly. The electric oven converts power to heat with no gases of combustion. Tests on exhaust gases show no CO_2 or CO from electric ovens while exhaust gas from gas ovens showed 4 to 5 per cent CO_2, with a trace of CO, and a reduced percentage of oxygen by this amount. It is possible to control the ventilation and admission of air in the electric oven to an extent impractical in ovens using fuels.

The oxidizing process is not hindered in the electric oven but is aided by the fact that fresh air is constantly surrounding the wire at all points. To further assist the complete chemical change in the wire coating, the air is repeatedly forced across the wires as they pass up, through the oven. Continuous motion of the air is insured by placing baffles on the sides of the oven. These baffles, while they in no way obstruct the operator in stringing the wires, act in a two-fold manner. They cause the necessary air to be forced into intimate contact with the wire, as mentioned before. Since practically all of the heat is obtained by convection currents of air, the baffles cause the heated air to flow to the line of the wire, and in this manner the two requisites of baking varnish—heat transfer and oxidation—are carried on simultaneously.

Centrifugal Casting of Guns

EXPERIMENTAL work on centrifugal casting of guns leads to the belief that the process has been satisfactorily established for the 37-mm. gun, the 75-mm. infantry mortar and the 75-mm. howitzer, says Major-General C. C. Williams, chief of ordnance, United States Army. A larger casting machine for production of the 75-mm. field gun, the 105-mm. howitzer and the 3-in. anti-aircraft gun is under construction, it appears, and will soon be in operation.

General Williams discussed the subject at a meeting of the Army Ordnance Association, Oct. 10. Approximately three mobile guns, he said, can be cast from the amount of molten metal that has heretofore been required for one built-up gun made from forgings. It is estimated, he added, that a gun can be cast and cold worked in approximately one-third the time and at about one-half the cost of built-up guns forged from ingots.

The physical properties obtained from centrifugal castings after treatment are better, he asserted, than obtained from forgings of the same composition. "The metal generally is exceedingly ductile and in this respect appears to be superior to that of forgings of the same composition. . . . Also the carbon is thrown toward the center in a gradual change so that, for example, in the 75-mm. pack howitzer, the carbon may be 20 to 25 points higher at the bore than at the outside. This gives greater strength at the bore where high elastic limit is needed and a correspondingly ductile outside wall. Segregations of other elements, although not so pronounced, behave generally like the carbon."

The frame work of the doors of the Goodyear-Zeppelin Corporation's airship factory and dock at Akron, Ohio, as well as that of the building proper, were manufactured and are being erected by the American Bridge Co., although the fact was not made clear in the illustrated descriptive article on the subject appearing in THE IRON AGE of Oct. 3.

Trade Association Is a Necessity

Group Effort Is Talisman of Successful Business—Sound Competitive Conditions and Expanded Markets Unobtainable Without Cooperation

BY CHARLES N. FITTS

WE are in the throes of economic forces which are steering us to new fields of endeavor, new opportunities of service, wider outlook and a greater spirit of industrial cooperation. Coincident with the narrowing margin of profit and the intensive cultivation of markets, we find business executives helplessly carried along with the tide. It is not to be wondered at that they are discovering that unless they are willing to cooperate with their competitors across the way, harmonize with other independent units in the industry, they will soon be swept aside, driven into a court of bankruptcy or swallowed up in another merger.

Business Individualism Invites Competition

The growth of the cooperative movement is something unprecedented. The Department of Commerce estimates that there are 13,000 trade associations and organizations in the United States, of which some 2000 are national in scope. This is more than six times as many as were operating 15 years ago.

In staid New England, where we have for generations believed and practised individual rights and maintained the most rigid spirit of aloofness, we are just emerging from a serious industrial slump. This depression, I believe, was due entirely to our tardiness in appreciating this newer trend in industry, which has fostered a widespread tendency toward cooperation in all sections of the United States. Once recognizing that, however, New England is rapidly forging ahead in profiting from cooperative effort.

Business individualism invites outside competition. Better organized industries from other sections of the country come in and take away from local firms the business that belongs to them by right of territorial location. That has happened in every backward section of the country. Of course, this is a sad situation, but there is a way to profit from it. We realize that if we would successfully combat these newer forces in business we must cooperate one with another. We must join together in trade associations, we must foster our cooperative tactics, forget our dignity and help each other to fight for that business which is rightfully ours.

CHARLES N. FITTS, of the New England Structural Steel Co., and President, American Institute of Steel Construction

Cooperation Does Not Mean Price Fixing

Through cooperation, competitive business units do not expect any longer to frustrate the spirit of the anti-trust laws. Efforts to fix prices or to restrain trade are foreign to their thought, and purely selfish interests are lacking to a far greater degree than the public would be led to believe. But because competitive units may not agree upon prices or divisions of markets is not denying that there is tangible profit in cooperative endeavors which are legal and ethical.

As a matter of fact the courts have decreed that trade statistics, upon which good business judgment can be based, may be gathered through cooperative effort and may be disseminated by a trade association. We can measure our markets and our stocks, even though we may not mutually determine prices. We may jointly develop new markets for our product, conduct research, advertise, hold patents, review legislative enactments and bills, petition Congress and jointly agitate for equable rates and tariff protection.

It is not strange, therefore, that we today witness trade associations of various sizes and of various kinds. The American Bicycle Manufacturers' Association has a present membership of six, while the American Bankers' Association has 21,000 members. Some are more concerned in the elimination of waste in marketing, whereas others are more concerned with excess plant capacity.

Never before in our history, the Department of Commerce has noted in its latest report on trade associations, has there been such a general willingness on the part of individuals and private organizations to unite in working for the constructive upbuilding of our commerce and industry through greater efficiency of each group of related interests. The exchange of ideas and knowledge among competitors, which would have been considered commercial suicide at the beginning of the present century, is now deemed mutually beneficial and constructive—a distinct contribution to higher business ethics.

Steel Industry Cultivating Consumer Markets

Take the steel industry, with which I am better acquainted, as an example. We have the American Iron and Steel Institute, a parent group of the steel mills, concerned primarily with the collection and dissemination of statistical information. There are some other branches of the hot steel industry organized, and a few of these, notably the Flat Rolled Steel Manufacturers, are actively engaged in market development upon a broad scale by research and advertising. In conjunction therewith we have numerous organizations of the fabricators of products from steel. The members of these organizations are really consumers of the output of the mills, but they also—like the American Institute of Steel Construction—are interested in promoting consumer markets for steel products.

In some ways the steel industry is supplied better with organized effort than others; yet I must confess there is much room for improvement. We are able to maintain active organizations in this industry because the out-

standing leaders are fully aware of the practical results that can be achieved. James A. Farrell, president of the United States Steel Corporation, in a speech the other day, said: "Any efforts designed to promote new uses of steel products or to expand their present usage, to assist both the manufacturing and consuming trade to a better understanding of the problems of initial manufacture and remanufacture, are worthwhile."

Promotional Efforts Must Be Honest

We, in the steel industry, look to Mr. Farrell as a leader, for we realize that few men in the business know so much about steel as he does. That is probably pretty generally acknowledged also outside the steel industry. In view of that fact I want to call attention to some remarks made by Mr. Farrell before the Flat Rolled Steel Manufacturers which escaped the attention of most of the newspaper editors of the country. These remarks should be carefully studied. He said:

> Remedies for any ills affecting our business are in our own hands. For instance, the orgy of excessive claims for the superiority of products differing but slightly, if at all, from those of other manufacturers, has assumed fantastic proportions. It incites competitive and expensive effort along similar lines by all competitors, with a mass of assertions and refutations which in the end merely serve to confuse the mind of the buyer or promote harmful conflict among manufacturers.
>
> If this is intended to be a challenge as to the lengthiest pocketbook in advertising achievement and promotional publicity, the challenge will, of course, be met by the interests who naturally resent insinuations as to the superiority of competitive product or the inferiority of their own.
>
> It is in effect a form of salesmanship universally abhorred, of decrying the wares of a competitor, or vaunting unfounded or unprovable claims of excellence of products whose chief merit may be in the assumption of a peculiar or meaningless name.

Many businesses have been ruined by the circus antics of competitors. Many an industrial reputation has been blackened by slander. Competent trade organizations are putting an end to such shameful tactics and we are beginning to realize that there is profit to us individually to bring them to an end. Structural steel is not alone in having suffered through unwarranted attacks by competition, or the unwarranted claims of superiority of other materials. Cotton, brass, coal and many other industries have been similarly deeply and unjustifiably injured.

False Claims Stopped by Ethical Codes

Of course, not all trade organizations came into existence merely to offset the inroads of competitive industries. Yet most of them have profited by the experiences of those that did. And the result is today we have established a code of ethics for competition, very largely put an end to false claims of salesmen, and stopped the circus antics of advertising and publicity.

An industry may gain a temporary advantage through leading the public into accepting a false estimate of its superiority. But that advantage is not long-lived, and the reaction is much more severe than were the gains previous thereto. The more truth we can put into our advertising and publicity, the more stability will we give our industry. Better business bureaus have sprung into being in every commercial city in the United States. They would have been impossible had not industries organized and through cooperative effort attained a better education of their duties and their obligations. The impetus this work has been given will carry the standards of ethical trading far beyond anything we can conceive of today.

> "WE can measure our markets and our stocks, even though we may not mutually determine prices.
>
> "We may jointly develop new markets for our product, conduct research, advertise, hold patents, review legislative enactments and bills, petition Congress and jointly agitate for equable rates and tariff protection."

The gold rivet story of the steel erector is a relic of the wooden nutmeg days. It has been a favorite with the press agent to commemorate an important structural job by saying a gold rivet was driven, whereas the facts were exactly contrary. Gold is too soft; it could not be used as a rivet. What actually occurs is that a regular steel rivet is gilded and displayed for the advertising satisfaction it affords. It is a harmless fake and probably the public cares little about it. But it is a successful fake palmed off on newpaper editors and should be stopped. Harmless as it may be to the public, it is injurious to the individuals in the industry, for it tends to encourage them to indulge in falsehoods in other regards.

New Business World in the Making

In days gone by it may have been possible to sell wooden nutmegs with impunity, but that was before the time of cooperative efforts on the part of trade associations. "Through group effort of business men," the Union Trust Co., Cleveland, recently declared in a published advertisement, "a new business world is in the making."

Trade relations and arbitration in commercial disputes are tending to do away with trade abuses and unethical practices. "For business success," the Equitable Trust Co. of New York stated in a paid advertisement, "a man must look beyond the confines of his immediate problems and keep abreast of his whole industry."

The majority of business executives are alive to the situation and appreciate the tendencies of the times. Even though they may happen to be so blind as to deny the practical benefits of cooperative effort, they cannot overlook the attitude of their bankers toward organization work. Every industrial unit is dependent upon his banker for capital and current cash. He would keep his credit impeccable. But it is difficult to do so and not join his trade association.

Wall Street has been engaged in some large financial operations in recent years. Stock listings on the "big board" have doubled since the war, and most of this represents new issues. I seriously doubt whether industrial units could have been accommodated so easily had the old days of ruthless competition and stiff-backed individualism continued. I doubt whether the public would have advanced its money to capitalize industries which refused to join in cooperative efforts calculated to promote better business conditions.

Trade association membership is really a talisman of a modern successful business.

"Lack of Responsibility Jeopardizes Scrap Trade"

The problem of costs in handling scrap iron and steel was discussed at the dinner meeting of the St. Louis chapter of the Institute of Scrap Iron and Steel, at the Lennox Hotel, St. Louis, Oct. 9. B. P. Williams, of Hickman, Williams & Co., president of the chapter, presided.

"At the bottom of many of the difficulties of the industry is a lack of responsibility," declared Benjamin Schwartz, director general of the institute. "The dealer who scrambles for scrap with the idea of showing a tonnage record, and without consideration to costs or profit, is not only injuring himself, but is engaging in unfair competition and is endangering the future of the industry. The dealer who 'doctors' hydraulic bundles or cars of scrap is not only eliminating himself, but is putting a stigma on the rest of the trade, and is menacing legitimate markets of others. The dealer who, through lack of interest or carelessness, allows accidents to occur in his yard, which could be prevented, is not only increasing his own cost of compensation insurance, but is hurting the rest of the trade, because that preventable accident is marked up against the industry in his State, with a certain increase in the basic rate for all the dealers.

"This lack of responsibility is at the root of many of the troubles in the scrap iron industry. If it is at all within the power of the printed and spoken word, the institute intends to organize a public opinion within the industry that will have to be reckoned with by every dealer who has been operating in entire disregard of the effects on his competitor and the rest of the industry."

Band Saw Handles Two Jobs Simultaneously

TWO jobs may be handled simultaneously, one on each side, on the metal-cutting band saw illustrated, which has been brought out by William Laidlaw, Inc., Belmont, N. Y.

Although designed for production work, the machine can be used economically where a variety of sizes and shapes are to be cut, and is adaptable to special cutting. An example of the latter is cutting of tools that require both rake and clearance. These tools can be cut in double lengths, from nested bars, on one side of the machine; then by using a special fixture the double length can be cut in two at a compound angle on the other side of the machine, the correct rake and clearance being thus obtained without further machining. The machine, designated as the type C.M.T., is heavy and rigid, and has capacity for cutting 12 x 12-in. bar stock.

A unique feature of the machine is that while the saw is in the center of the vises and carriages, rather than on one side as in the usual practice, either side can be set quickly for cutting at any angle, and an automatic stop prevents the saw from cutting into the vise should the operator be away from the machine when the cut is finished.

The tables swivel to permit cutting of long pieces on either side without interfering with the work on the opposite side of the machine. Pieces up to 30 in. long can be cut without twisting the saw on either side; for pieces longer than 30 in. a twist of only 15 deg. is necessary. It is claimed that having the saw run without twist the greater part of the time results in better work and an appreciable increase in the life of both the saw and the saw guides.

Quick - acting vises requiring no wrenches are mounted on heavy carriages supported on steel balls that travel in accurately machined ways. Carriages are held downward by annular ball bearings contacting a special inverted way with an adjustment for taking up wear. A downward work clamping device is also provided. These two features are said to prevent either the work or the workholding members from raising upward on the left, or up-cutting, position.

The two 30 in. x $1\frac{1}{2}$ in. disk band wheels are a combination of cast iron with steel disks on each side, and are light and rigid. They permit the use of a simple guard that extends only around the outer periphery of the wheels and to the cutting point. Saws can be changed without removing the guards. The upper wheel is mounted on cup and cone ball bearings.

The power unit, consisting of motor, speed-reducing gears and four-speed sliding gear transmission, is mounted on a plate in the base of the machine. The entire unit is ball bearing and all gears and bearings run in oil. All parts are doweled to assure correct alinement. A large door on each side of the machine permits access to the various parts and the arrangement is such that the base plate with all parts mounted on it can be removed from the frame castings as a unit. Speed changes are made by means of a shift lever that extends up through the frame casting to the operating position.

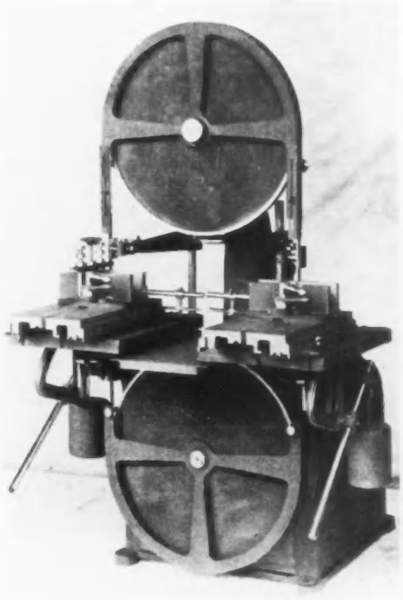
Large Bars and Billets Cut on Vertical Saw

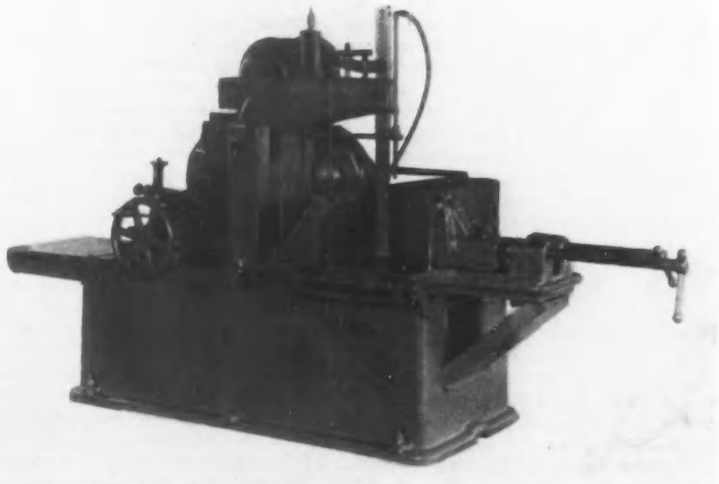
THE Peerless Machine Co., Racine, Wis., has brought out a heavy-duty vertical metal sawing machine having a capacity of 14 x 16 in. The machine is intended for cutting large bars and billets, which can be placed on or removed from the table by an overhead crane. The vertical position of the blade also makes possible the application of a stream of coolant at the top of the cut. The blade automatically relieves itself on the non-cutting stroke, and at end of cut the machine is automatically tripped out.

A roller device is built in each side of the work table so that when a large bar or billet is placed thereon the operator by the use of a handle can raise the piece of work, where it will remain until he has rolled it to the point where it is desired to be cut. Then by lowering the handle the stock rests on the table. Each of the front vise jaws is arranged with hardened steel serrations to prevent shifting of the stock.

The pressure mechanism by means of which the blade is fed into the work includes both a positive and compensating feed, the positive feed being provided with a safety device to prevent the blade from breaking when it becomes dull. Ball bearings are used throughout the machine, and the transmission runs in oil. Three speeds are obtainable, and a trip can be set to cut out the machine at any given distance within its capacity. Saw blades from 17 to 24 in. long can be used. The machine is driven by motor and chain. It is 10 ft. long, 4 ft. 4 in. wide and 4. ft. 9 in. high. The weight is approximately 4500 lb.

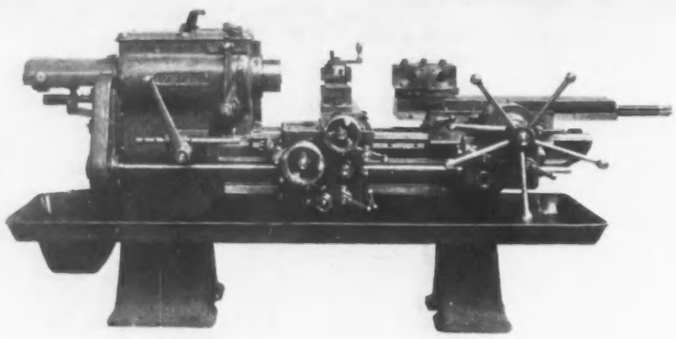
Freyn Engineering Co., Chicago, has been engaged as consultant by the Otis Steel Co., Cleveland, in the remodeling of the No. 2 blast furnace plant at the Riverside Works of the Otis company.





The Metal Cutting Band Saw, at the Left, Is Designed to Permit Handling Two Jobs Simultaneously. The saw blade runs without twist except when cutting unusually long pieces

In the Vertical Sawing Machine Above, Large Bars and Billets Can Be Placed and Removed by an Overhead Crane



Universal Turret Lathe with New Features

A TURRET that is clamped and unclamped automatically is an outstanding new feature of the No. 4 universal turret lathe recently brought out by the Gisholt Machine Co., Madison, Wis.

A bevel clamp ring, operated by an eccentric toggle, is opened and closed automatically by the backward and forward travel of the turret slide. It binds the turret rigidly to the slide, with no increase in the effort needed to move the slide. Two movements per station, or 12 movements where a full set of tools are used, are thus saved for the operator and damage and loss of accuracy arising from failure to clamp the turret tightly to the slide after indexing is eliminated. The entire strain of the cut is taken by the bevel clamp ring, the locating pin and bushings having only to position the turret. A protected positive gib lock keeps the turret slide in alinement. The stop roll, of new design, permits adjustment to 0.002 in. between the automatic feed trip and the dead stop.

Twelve spindle speeds, from 28 to 751 r.p.m. are obtained selectively through sliding gears and a positive jaw clutch. A single lever controls the starting, stopping and reversing of the spindle through a multiple disk clutch. A brake is applied automatically in the neutral position of the control lever and a special safety latch prevents accidental starting of the spindle. Hardened alloy steel gears mounted on spline shafts, tapered roller bearings for the spindle and drive shafts and centrifugal lubrication of all gears and bearings are features of the headstock. Speed change levers seat firmly and are positive in position. The machine is driven by 3-hp. 1200-r.p.m. motor through Texrope belts and balanced drive pulley, the motor being mounted on the rear of the headstock leg. It is claimed that speed rating may be doubled without damage to bearings or clutches.

Automatically indexed square turret is another feature. The square turret is mounted on the front of the bridge-type cross-slide. It indexes automatically with the release of the clamping lever, permitting the operator to use his right hand for indexing and clamping while his left hand positions the carriage for the next cut. An auxiliary tool-holder may be mounted on the rear of the cross-slide for the cutting off or for use of taper attachment. The carriage moves on hardened steel ways with apron bearing on the bottom of the bed. Apron parts run in oil, and a hand-operated pump is provided for lubricating the bed ways, cross-slide and cross-feed screw. Taper attachment and threading attachment supplied as extras.

Specifications are:

Automatic chuck capacity, round stock 2 in.; hexagon stock, 1¾ in. and square stock, 1⅞ in. Swing over ways, 19¾ in.; swing over cross-slide wings, 17¼ in., and swing over cross-slide, 10¼ in. The maximum distance from the face of the turret to the end of the spindle nose is 31 in., the longitudinal travel of the hexagon turret is 14 in., the swing over the turret slide is 7⅜ in., the longitudinal travel of the cross-slide is 26 in., and the cross travel of the cross-slide is 10⅞ in.

Floor space occupied is 40 x 99 in. and the length of the bar feed beyond the pan is 38 in. The net weight of the machine is 3450 lb.

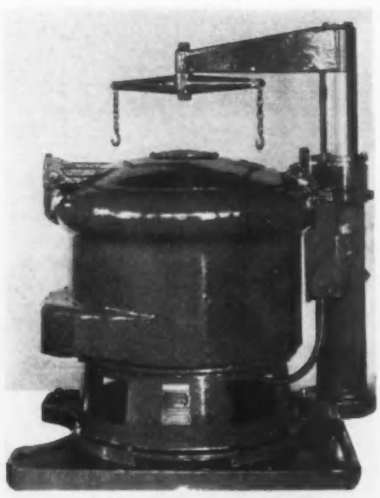
Centrifugal Oil Extractors, Washers and Dryers

STURDY construction, minimum of vibration and safety of operation are features of an improved self-contained motor-driven centrifugal oil extractor which is being marketed by the Leon J. Barrett Co., Worcester, Mass. Extraction of 90 to 95 per cent of the cutting oil from saturated chips is claimed. It is estimated that 100 lb. of average chips pick up 3 gal. of oil; 1 gal. of this oil may be recovered by draining overnight and practically all of the remaining 2 gal. may be recovered in 2 to 3 min. by the centrifugal extractor.

The starting lever is interlocked in the neutral position so that the machine cannot be started inadvertently. The lid of the extractor is a semi-steel casting and is balanced to facilitate raising and lowering. The arrangement is such that to operate the machine the lid must be closed and locked, and when the lid is locked all moving parts are inaccessible. The starting lever is arranged to prevent unlocking while the machine is in operation, either in the running or braking position. Unlocking the cover shuts off the current automatically. The machine is available with either hand chain or hydraulic hoist.

Cyclone dryers for the rapid and complete drying of washed metal parts are also built by the company. Air under room conditions is drawn in and forced through the contents of the machine, entering through a dehumidifier in the cover containing electric heating coils. The heating and expanding of the air occurs at the point of entrance; drying is effected, first, by expelling the surplus moisture by centrifugal force; and second, by absorbing the remainder by the rapid swirling current of heated air.

Self-contained Typhoon metal parts washers are also manufactured. In the center of the pan there is a cone having a series of holes in the upper part but with the bottom open. The parts to be washed free of grease, oil, soda, alkali or acid are placed in the pan and brought up to speed. Water or other fluid, under valve control, enters the central column and passes through the holes in its side wall, due to centrifugal force, and thus the impurities from the inner side of the load are carried to the wall of the pan. A much larger quantity of water passes down through the opening of the bottom of the cone, up the sloping side with continually increasing velocity, flushing out all the impurities that may have become washed to or collected along the wall. The supply valve is then shut off and in a few seconds all the water is thrown off from the parts in the pan. A strong suction is caused by the rotating bowl, and the air rushing in and through the parts in most cases dries the product. A heating or dehumidifier grid may be applied.



Reclaiming of 90 Per Cent of the Oil from Chips Is Claimed

Notable Progress in Steel Research

Pittsburgh Group Studies Manufacture of Clean Steel and Iron Alloys of High Purity

STANDING room was at a premium at the afternoon session of the third open meeting of the Metallurgical Advisory Board to the Carnegie Institute of Technology and the United States Bureau of Mines, held in Pittsburgh Oct. 18. About 250 prominent metallurgists and research workers from all sections of the steel industry crowded the auditorium at the Bureau of Mines, and listened to the reports on investigations now in progress at the two institutions. A five-year research program was initiated in 1926, and in the intervening three years some $150,000 has been spent, of which $55,000 has been contributed by 43 steel companies in the Pittsburgh district. The work is gaining momentum constantly; 30 men are now engaged, nine on the Bureau of Mines staff, six of Carnegie Institute's faculty, seven research fellows, and eight employees of the Advisory Board, four of the latter being engaged in plant research. F. N. Speller of the National Tube Co., chairman of the Advisory Board, praised the active cooperation by operating officials of the several steel companies where open-hearth steel making reactions are being studied on a grand scale.

Quantitative Estimation of Slag Inclusions

Dr. C. H. Herty, Jr., physical chemist of the United States Bureau of Mines, has been giving his entire time since the beginning of the investigation to a study of the non-metallic inclusions in steel, with particular reference to the underlying chemical reactions between metal and slag in an open-hearth furnace and to the conditions responsible for "dirty" steel. Laboratory studies in connection with this problem have included the solubility of iron oxide in steel and various kinds of slag, the effect of commercial deoxidizers on these solubilities, the viscosity of slags at various temperatures, the chemical and microscopical identification and analysis of inclusions and gases in steel.

Lack of precision in the last mentioned items has hampered the progress of the work, and especially the correlation of data gained from open-hearth heats to the theoretical results of laboratory findings. The high spot in Dr. Herty's report, therefore, was the announcement of the discovery of new methods for measuring the amount of sonims contained in steel. These new methods have been used in re-analyzing and re-computing some old data, and have served to explain former unexplained and puzzling discrepancies.

In the study of deoxidation by silicon, for instance, it was known that the best chemical method for determining oxygen in steel was inaccurate in the presence of much silicon or manganese. In order to get some more accurate data, polished samples of the steel were examined for inclusions under a micrometer microscope; each globule was measured and classified as to its nature (whether glassy type containing about 80 per cent silica, the intermediate type, or the "F-type" with about equal amounts of silica and iron oxide). Duplicate slag counts of this sort made on various planes through a metal sample, gave remarkably concordant results. In over 120 samples there was also found much more visible oxygen than given by chemical analysis—60 per cent excess at times.

This new method of visual determination, and a new electrolytic method of segregating non-metallic inclusions, form not only a new basis of appraising past work on slag-metal reactions, but also will be used in future work on the synthesis of inclusions in the laboratory and their identification in steels.

Deoxidation of Steel with Silicon

Plant studies on the deoxidation of steel with silicon started three years ago. Complete data on several heats from 40-ton, 90-ton and 250-ton furnaces have been obtained. Heats would be worked down to 0.10 to 0.14 per cent carbon and 100 lb. of silicon added to kill the metal; the bath would then be reboiled, and in about 30 minutes would be tapped, adding manganese only in the ladle. Frequent samples were taken at all stages, and Dr. Herty concludes from all the studies that silicon so used, alone in the furnace, produces steel no cleaner than other heats made without it, so the added ferroalloy and the time required are wasted. While it deoxidizes the bath temporarily, it does not eliminate the glassy silicates formed. Silicon and manganese both are needed for cleansing action, and studies on this practice are now being pushed so intensively that results should be available within the next year. Proper deoxidation and cleanliness require big inclusions of the F-type, which will be rapidly eliminated. Later reoxidation from the slag may be prevented by increasing the viscosity of the slag or skimming it at the end, or by lowering the iron oxide in the slag as much as possible without rephosphorization.

Effect of Sonims on Seamless Tubes

Forty-three heats of steel designed for a seamless tube mill were studied, especially the relationship between slag inclusions and chipping costs and the physical properties of the finished steel. Full results are to be published soon, but it may be said that chipping costs and workability of the pipe steel is related to so many other factors than sonims that unless the latter are unusually numerous no specific influence can be noted. However the strength, elastic limit and ductility of the metal (both in longitudinal and transverse directions) are adversely affected by increase in "dirt."

Standards for Abnormal Steel

Of the many important offshoots of the main investigations outlined briefly above may be mentioned studies by Dr. V. N. Krivobok and his associates at Carnegie Institute of Technology into the reasons for random grouping of crystal aggregates after carburizing. At the outset it was endeavored to set up standards of comparison for so-called "normal" or "abnormal" steel (as defined by the McQuaid-Ehn test). For this purpose some oxygen-free iron from a vacuum fusion was carburized, and a pearlitic structure was found which contained but little granulated cementite—a structure neither abnormal nor normal. Further investigations indicated two types of abnormality, (a) structural abnormality involving segregations of cementite and (b) grain size abnormality involving non-uniformity in size.

Certain factors were found to influence the structural type of abnormality; for instance, manganese in steel makes for normality; the rate of solidification in the ingot and the rate of cooling from the carburizing furnace also have an influence. Oxygen in the steel as iron oxide undoubtedly promotes structural abnormality; if such a steel is deoxidized by aluminum or silicon the structure is like carburized pure iron, i.e., neutral.

Grain-size uniformity is promoted by the carbon originally in the steel. Manganese coarsens the carburized grain.

The effect of sub-microscopic inclusions is still doubtful, as all steels are believed to have such particles; normal carburized microstructures have been found in steels certainly full of them.

Pure Manganese and Manganese-Iron Alloys

A considerable quantity of pure manganese (spectroscopically free of silicon and aluminum) has been made by distillation, as described in THE IRON AGE, Dec. 13, 1928, page 1499. When alloyed with pure iron, and melted in special equipment to prevent contamination by oxygen or other elements, the resulting steels containing 0.2 and 0.4 carbon and 7 and 10 per cent manganese are remarkably tough. They have a hardness of 37 to 45 Rockwell C and harden quickly on cold work. Hardness, however, is little affected by hot forging or by heat treatment. Thermal analysis shows no critical points. The microstructure develops Widmanstattian markings, the more pronounced as manganese increases. This structure is explained on the hypothesis of two distinct solid solutions.

Studies are also being continued of the commercial cast manganese steels of the Hadfield type. It has been found that the microstructure and critical temperatures of such alloys may be changed materially by preliminary

heat treatments, and an effort is being made to intensify this effect so that steels of unique properties may be produced.

Studies on Alloy Steels

Another side line of investigation concerns the development of steels made with alloys produced in the United States which may be substituted for others made with imported metals. Related to this is the study of special analyses for extra severe duty, either at high temperature, high pressure or in corrosive atmospheres. A preliminary exploration was made of the chromium steels containing 0.10 to 0.60 per cent carbon and 16 to 35 per cent chromium—a field which is relatively unknown. Microscopic and thermal analyses have developed a provisional equilibrium diagram showing four constituents, one of which is new. All the findings are in accordance with the assumption that chromium is an element which stabilizes alpha iron and restricts the formation of the gamma configuration.

On account of the interest in the so-called 18-8 stainless irons, a considerable quantity of a pure iron-chromium alloy containing 18 per cent chromium will be manufactured, and with this as a basis a series of alloys containing increasing additions of carbon and nickel will be made and the physical properties studied, especially at high temperatures.

T. M. Girdler to Join Eaton-Mather Group

Jones & Laughlin President Resigns—Will Be Actively Engaged in Plans for Merger of Steel Companies

T. M. GIRDLER, president of the Jones & Laughlin Steel Corporation, has resigned that position to become associated with the Eaton-Mather financial interests of Cleveland. This group, headed by Cyrus S. Eaton of Otis & Co., Cleveland investment bankers, is said to be one of the largest owners of steel company stocks in the country. Most of these stocks are owned by two holding companies, Continental Shares, Inc., and the Cliffs Corporation, which are affiliated with Otis & Co.

Mr. Girdler's association with the group, according to the official announcement, is regarded "as an indication of other important steps to follow." It is stated that Mr. Girdler will not be connected in an executive capacity with any of the steel companies in which the Eaton-Mather group is interested, but will be actively engaged in "the development of plans affecting the iron and steel industry."

It is officially said that the selection of Mr. Girdler is a forerunner of the announcement of a large merger of independent steel companies. No intimation is given as to what companies will be put together in such a merger, though it has been generally assumed in the steel industry that the Republic Iron & Steel Co. will be prominent because of the large interest of the Eaton group in that company. Mr. Eaton is generally credited with being responsible for the acquisition by the Republic company of the Trumbull Steel Co., Warren, Ohio, and Steel & Tubes, Inc., Cleveland.

Companies in which Continental Shares, Inc., and the Cliffs Corporation are financially interested include the Inland Steel Co., Central Alloy Steel Corporation, Otis Steel Co. and Donner Steel Co. The Cliffs Corporation some months ago acquired complete ownership of the Cleveland Cliffs Corporation through an exchange of stock. Cyrus S. Eaton is a director and member of the executive committee of the Republic company and a director of Inland Steel Co. and the Central Alloy Steel Corporation. William G. Mather, with whom Mr. Eaton is now closely associated, is chairman of the board of the Otis Steel Co. S. Livingston Mather is a director of Otis Steel.

T. M. GIRDLER

Mr. Girdler will enter upon his new duties Nov. 1. No successor has yet been named by the Jones & Laughlin Steel Corporation. Mr. Girdler's new official connection will be as a partner in the banking firm of Otis & Co. He was elected president of the Jones & Laughlin company on Jan. 12, 1928. He was graduated in mechanical engineering from Lehigh University, Bethlehem, Pa., in 1901, and immediately became associated with the Buffalo Forge Co., Buffalo, N. Y. Shortly afterward he was sent to London, England, as sales engineer and assistant to that company's London representative.

In 1902 Mr. Girdler returned to this country to become identified with the Oliver Iron & Steel Corporation, Pittsburgh, remaining with that company until 1905, when he went with the Colorado Fuel & Iron Co., Pueblo, Colo. Two years later he became general superintendent of the Atlantic Steel Co., Atlanta, Ga., remaining with that company until 1914, when he joined the Jones & Laughlin company as assistant to the general superintendent of the Aliquippa works, Woodlawn, Pa. Later he was successively assistant general superintendent and general superintendent of that works and general manager of all plants and properties of the company. He was elected vice-president and a director of the company in 1925, holding that position until his accession to the presidency.

Merger of Screw Machine Products Organizations

A merger of the Screw Machine Products Association with the Screw Machine Products Institute was officially authorized in Chicago on Thursday, Oct. 17, at a meeting of the former organization. About a year ago a survey of the screw machine products industry was made by Dr. Arthur E. Swanson. Upon his recommendation the Screw Machine Products Institute was set up among members of the association to work out certain policies and plans centering largely around cost studies. This has now progressed to the extent that it was felt that all of those in the association should share in the benefits to be derived and, as a result, the institute takes over the activities of the former association. Dr. Swanson, who has been director of the institute since its organization early this year, continues as director. The management is in the hands of the officers and directors of the former association. Group meetings are planned for the future.

Loan Made for Two Ships; 22 Boats to Be Scrapped

WASHINGTON, Oct. 22.—The Shipping Board has approved a loan to be used by the Oceanic Steamship Co., San Francisco, in aid of constructing two 11,300 deadweight tonnage, combination passenger-cargo vessels, the contract for which has been drawn up by the Bethlehem Shipbuilding Corporation. According to the board, it is expected that the ships will be built at the Fore River yard at Quincy, Mass.

The board also has announced the sale of 22 laid-up vessels to the Union Shipbuilding Co., Baltimore, with the understanding that the vessels will be scrapped. The vessels were sold for $335,000 cash.

Gray Iron Institute in Annual Meeting

A Cost System Adopted—Research Plan Outlined—Scheme for Certifying Castings Recommended

A PLAN for adopting standards of quality for gray iron castings and for certifying castings that come up to the standard was recommended to the Gray Iron Institute by its president, Walter L. Seelbach, at its second annual meeting held at the Hotel Cleveland, Cleveland, Oct. 16. This certification would be a guarantee of quality. Members would be allowed to use the seal and trademark on their products after safeguards in the way of tests had been provided to give assurance that the castings were up to the adopted standards of quality. These tests would be made by recognized laboratories in the various districts.

Mr. Seelbach said that it is difficult to work out a method of certification, but he believed the problem could be solved. Included in the suggested plan would be the carrying out of a publicity program by means of which he believed the public would come to accept certified gray iron castings.

The adoption of a cost system was announced and this will soon be issued in pamphlet form. Reports of various other committees indicated that the institute has accomplished a great deal of work during the past year and has much under way. Speakers expressed the feeling that the gray iron industry is in a much more favorable position than a year ago, that the merits of gray iron castings are being more generally recognized and that the competition of other products as substitutes for castings has been largely reduced.

Growth of Institute Satisfactory

The institute has enjoyed very satisfactory growth the past year, but still needs additional members to aid in carrying out the work it has undertaken. Starting with a membership of 40, it had 83 members at the annual meeting a year ago and its present membership is over 200. The registered attendance at this year's meeting was 119, representing 19 States and Canada. Eighty-two member companies and 42 cities were represented.

Four new directors were elected for a three-year period. They are as follows: J. D. Coltman, Bullard Co., Bridgeport, Conn.; William J. Grede, Liberty Foundry, Inc., Wauwatosa, Wis.; E. H. Williams, Vulcan Mold & Foundry Co., Latrobe, Pa., and R. M. Hill, East St. Louis Castings Co., East St. Louis, Ill. The old officers were reelected. They are:

President, Walter L. Seelbach, Forest City-Walworth Run Foundry Co., Cleveland; vice-presidents, B. H. Johnson, Florence Pipe Foundry & Machine Co., Florence, N. J., and A. E. Hageboeck, Frank Foundries Corporation, Moline, Ill.; treasurer, H. S. Chafee, Builders Iron Foundry, Providence, R. I.; assistant treasurer, H. C. Wilson, Cleveland, Cooperative Stove Co., Cleveland, and manager, Arthur J. Tuscany.

Industry's Present Status Improved

The gray iron industry presents a different picture from that of a year ago and, through the work of the institute, a good name has been established for gray iron castings, declared President Seelbach in his annual report. The industry was threatened a year ago, he said, with encroachments by other products. He summarized the work accomplished during the past year. The working out of a uniform cost system, he believes, will solve the problem of getting fair prices. New uses should be found for gray iron castings rather than trying to compete for products for which other materials are better suited.

Conditions that led to the formation of the institute early in 1928 were reviewed by Manager Arthur J. Tuscany, who declared that the gray iron industry had found it necessary to organize for its own protection. The institute, he said, has made a good start in showing the importance of gray iron. It has created a more favorable attitude on the part of the public in general and of casting buyers toward castings. Gray iron has advanced and is now shown at its true worth.

Reviewing the various activities of the industry during the year, Mr. Tuscany said that through its efforts the gap between excess production and consumption had been reduced. Some consumers of castings had been shown that it would be more economical for them to buy castings outside than to operate foundries and in other cases the building of excess foundry capacity has been discouraged. He referred to the adoption of the cost system as an important achievement of the year. While a fair start has been made along various lines, Mr. Tuscany pointed out that there is yet much to be accomplished. The report of the treasurer showed that the institute is in a healthy financial condition, its receipts during the year having been well above expenditures.

A Cost System Adopted

The report of the cost committee was submitted by its chairman, J. L. Carter, Sacks-Barlow Foundries, Inc., Newark, N. J. He said that a standard cost system and a general accounting system were among the most important needs of the industry. The aim of the committee was to develop a cost system applicable to both large and small foundries and in their work the members were assisted by many practical foundrymen, as well as expert accountants. Various systems were studied, and the committee attempted to pick out the best features of each.

Systems studied were found to be largely similar except as to the methods of determining cleaning and shipping costs. The committee found the most difficulty in arriving at a method for determining cleaning costs. It made actual studies of various methods and found that often foundrymen guessed at their cleaning costs. The committee held that the only satisfactory method of figuring cleaning room costs was by basing these on the direct labor of cleaning, together with indirect labor costs. There would be valid objections if uniform labor charges were applied to all kinds of jobs. This difficulty, however, will be solved by so carrying cleaning costs that actual costs can be figured on special jobs. In the opinion of the committee many leaks would be stopped by the adoption of the system.

The second objective of the committee is to induce foundries to adopt the cost system. Mr. Carter favored the holding of local group meetings of the foundrymen at which the system would be explained. An experienced cost accountant will usually be required to help place the system in effect. The institute would supply expert accountants for that purpose. The cost committee also reported that it had extended its work to include a system of uniform accounting.

The finance and budget committee, through its chairman, Howard O'Neil, Western Foundry Co., Chicago, reported that the institute has sizable funds available for continuing its various activities during the coming year.

Standard Sales Agreement Developed

The merchandising committee through its chairman, Don McDaniel, Decatur Castings Co., Hamilton, Ohio, reported that the committee has developed a standard sales agreement and trade customs and, in addition, has prepared various pamphlets which have received favorable comment. A number of problems confront the committee, he said. Facts developed by the research committee should be presented to buyers of castings. Mr. McDaniel felt that a survey of the gray iron industry is needed and that a survey should also be made of some one outstanding industry in other fields, believing that such a survey would be of value in solving the merchandising problems of the gray iron foundries. An important task of the institute, he said, is to sell the organization to buyers of castings. The seal of the institute should be made to mean something, and he believed a suitable slogan should be developed and that a technical department should be established to show where gray iron should be used. Mr. Seelbach, commenting on reports, said that the merchandising committee had the hardest job of all the committees.

Plan of Research Outlined

The research committee through its chairman, B. H. Johnson, reported that it had studied the work of other organizations and had endeavored to set up a program to show what has been done and is being done along the

line of research work. A plan was briefly outlined for making tentative recommended practices for certain gray iron castings. Under the plan 25 foundries will be selected from which test bars will be secured and tests will be made and the results tabulated. Information will also be secured as to cupola practice, mixing, etc. This investigation will lead to standard specifications for certain classes of castings and engineers will be supplied with these specifications. The association will keep the specifications up to date. The committee will cooperate so far as it is able with the Engineering Foundation in research work in alloy iron and steel.

The statistical committee, through its chairman, K. L. Green, Green Foundry Co., St. Louis, reported that 115 members are making monthly trade reports but the number should be increased. Mr. Seelbach said that he carefully studied these reports and found them valuable in his business.

Mr. Tuscany presented the report of the trade practice committee for R. M. Hill, chairman. This committee has made a study of conferences held in other industries with a view of determining how conferences would help the gray iron industry. The committee had decided to make further investigation before determining the character of conference that would be best suited for the gray iron industry.

Members will be allowed to use the institute's seal on their castings or stationery on securing permission from the executive committee under a change voted in the by-laws.

Trade Associations Important Factors

The business sessions were supplemented by an interesting program of three speeches on topics that appealed to the gray iron foundrymen. At a group luncheon meeting a talk was given on the business man and his trade associations by Dr. Hugh P. Baker, manager of the Trade Association Department, Chamber of Commerce of the United States. Trade organizations, he predicted, will become more important factors in business than at present. Bankers, he said, are looking with favor on membership in trade organizations by industrial companies, believing that there is a sounder upbuilding of industries by organized effort. He listed as outstanding problems of industry, overproduction, price cutting, invasion of another's territory, wasteful, harmful practices that lead to unfair competition, lack of standards and nonmaintenance of quality. The speaker emphasized the importance of a sound cost system and the gathering of statistics covering all phases of the industry. Codes of business practice, he said, are helpful but often are not lived up to in periods of depression. Good results have come from trade practice conferences. Trade promotion is an important activity. He urged the foundrymen to sell quality and service.

"The New Day Marketing" was the subject of a talk by R. R. Cunningham, National Sales Development Service, Cleveland. The speaker added a pleasing mixture of humor to his talk, which covered some of the problems of distribution. Declaring that the price is not the only thing in merchandising, he also emphasized the importance of quality and service, which he said was counting for more every day. Long profits are in noncompetitive selling in which the seller is rendering service.

Labor Control Changing

Labor cost control in jobbing foundries was discussed by T. M. Harrison, Stevenson, Harrison & Jordan, New York and Cleveland. He outlined a method of setting molding and coremaking piece rates developed for making wage incentives possible in jobbing foundries despite frequent changes due to short runs. Management and labor control has been undergoing a change, he said. The number of employees that are paid according to time is growing smaller. In foundries a great deal of work is being done on a day rate, because of short runs, on which piece rates could be applied. Often piece rate on such work is likely to be set by a foreman relying only on his judgment. Under the system presented, scientific methods take the place of the foreman's judgment.

Standard Time for Each Job Advocated

The speaker described molding as a combination of various minor operations and pointed out that standards can be established by time studies of these various elements, these being largely mechanical. He demonstrated the system by exhibiting a pattern and describing the method of figuring out the time allowances by taking measurements of the pattern, showing area and cubic contents, taking the cubic contents of the flask, net sand, classification of cores, etc. The data obtained showing standard times for various operations were tabulated, the total being the standard time for the job. For a jobbing foundry he advocated a bonus rather than a piece rate system.

The speaker contended that poor performance in a jobbing foundry is often the fault of the management and not of the molders and that the adoption of a wage incentive system will cause a foundry to be organized so that skilled men will not be doing unskilled work. The system he discussed, he said, would enable a jobbing foundry to predetermine its costs and help eliminate unintelligent competition. He claimed that by using the system a jobbing foundry would make a net saving of over 20 per cent.

The meeting closed with a banquet and entertainment in the evening.

Herberts-Moore Machinery Co., San Francisco, has been appointed exclusive sales agent in northern California and Nevada for South Bend engine lathes made by the South Bend Lathe Co., South Bend, Ind.

Shop Equipment Exhibited at Bridgeport

A WIDE variety of shop equipment and supplies was shown at the second cooperative exposition held under the auspices of the Salesmen's and Purchasing Agents' Association of America, Inc., at the Pyramid Shrine Mosque, Bridgeport, Conn., Oct. 17, 18 and 19.

Gross space of approximately 13,500 ft. was occupied, and more than 125 companies were represented at the 60 or more separate booths. About 50 companies were unable to obtain space, and the taking of larger quarters for the next exposition is being considered. The attendance was in excess of 5500.

All classes of factory supplies, including tool steels and small tools, were on display. Widia tungsten carbide tools were shown by Hunter & Havens, representing Thomas Prosser & Son, New York, and Strauss metal tools were displayed by the Ludlum Steel Co., Watervliet, N. Y. The carboloy Co., New York, demonstrated its tools in connection with a 36-in. Bullard vertical turret lathe. Heppenstall die steel of 0.48 per cent carbon and 0.63 per cent manganese was machined at 190 ft. per min., 5/16-in. cut, and 0.033-in. feed. Bronze bearing metal, copper 85 per cent, and lead, tin and zinc 5 per cent each, was turned at 450 ft. per min., 5/8-in. cut, 0.068-in. feed, the tool holding its edge for a long period. High test iron castings such as used in Bullard machine tools was machined at the rate of 220 ft. per min., ½-in. cut, 0.068-in. feed. This material has a tensile strength of 38,000 lb. and hardness of 207 Brinell.

Displays of chromium-plated products were another center of interest. One company showed chromium-plated files, the plating on which was said to markedly prolong the life of the tools. Another concern exhibited a large chromium-plated roll used in the production of highly finished sheet brass, the plating being applied to resist wear.

Officers of the association are: R. T. Phipps, Bullard Co., Bridgeport, president; W. H. Bradley, Hunter & Havens, vice-president; L. R. Watkyns, Max Ams Machine Co., secretary; and F. H. Braithwaite, Wellington-Kincaid Co., treasurer.

Celebrates Opening of New Plant Addition

To celebrate the opening of its new factory addition, which adds 60 per cent to its production capacity, the Brown Instrument Co., Philadelphia, maker of indicating, recording and controlling instruments, held a company party on Oct. 3. In honor of the event a souvenir program was printed containing a history of the company by Richard P. Brown, president. Organized in 1860 with two employees and an annual business of $16,000, the company now employs 500 people and its sales approximate $3,000,000 a year.

This Issue in Brief

Strategic location of factory lowers cost to consumers. Nine-tenths of all industries are improperly located, investigators estimate. They have been placed where they are, by chance or by rule-of-thumb methods, while keen competition requires manufacturers to seek the lowest possible cost.—Page 1089.

* * *

Material-handling costs are cut by using lifting magnets. Their use need not be confined to handling bulky materials, such as pipe, plate, scrap, etc. They can lift and move boxed parts also.—Page 1097.

* * *

Your repair man should have a lock or warning sign to place on the starting lever of the conveyor before repairing it. Don't let him adjust or repair the conveyor while it is in motion, as the percentage of accidents from this source is high.—Page 1099.

* * *

You can not make a high-strength cast iron merely by introducing alloys into inferior irons. Alloys act simply as an aid to the betterment of a condition. But properly used, it is easy to produce a high-strength iron without special processes.—Page 1101.

* * *

Nitrides large parts in world's largest nitriding furnace, 26 ft. long between doors. Parts are placed in a nitriding box 22 ft. long, mounted on an 8-wheel motor-driven car. A fan located in the box circulates the gas through the work.—Page 1102.

* * *

Low-cost foundry operation is encouraged by use of the proper kind of coke. Therefore, Pennsylvania coke manufacturer experiments and discovers a new process which enables him to make beehive coke comparable with by-product coke, in both physical characteristics and chemical analysis.—Page 1091.

To combat today's competition successfully, manufacturers in the same industry must cooperate one with another. The most efficient means of doing this is through trade associations. Competent associations can discourage unfair competitive tactics within the industry and help fight "outside" competition.—Page 1107.

* * *

When joining thin-walled steel tubes by brazing, beware of high heat. Better keep the brass below 1100 deg. C., for steels which have been subjected to severe cold work tend to recrystallize strongly when subjected to the heat of the brazing liquid.—Page 1103.

* * *

Danger signal of too little or too much heat in hardening bath is given by colored lights connected to pyrometer. This signal enables operator to regulate the introduction of axes into the lead hardening furnace, so that the proper temperature will be maintained.—Page 1095.

* * *

Not much shifting of factories from one place to another. Relocations account for only 10 per cent of growth in number of plants, survey reveals. Great bulk of new industries in any community are *new* local manufacturing businesses.—Page 1090.

* * *

Cleaning costs are often guessed at by foundrymen, survey reveals. Cost committee finds most difficulty in arriving at a method for determining real cleaning costs. The only satisfactory method is to take the direct labor cost, and add indirect labor.—Page 1113.

* * *

Moving messages impress "safety first" on workers' minds. Overhead conveyor bears safety slogan signs, so arranged as to appear about every five minutes at a given point.—Page 1100.

Keeps hardening bath temperature fluctuation within 7.5 deg. Fahr. plus or minus by means of double control instruments, double circuits and switches. In axe plant one circuit is entirely off the recording control pyrometer for the salt bath and is placed on the control pyrometer for the heating chamber.—Page 1095.

* * *

What is "slush molding?" Method used in making zinc statuary can be applied successfully to cast iron. Molten metal is poured into the mold and allowed to stand just long enough so that the desired thickness of metal sets against the mold surfaces, after which the still molten iron is poured out. No core is used.—Page 1096.

* * *

Revamps old motor to provide greater power for larger rolling mill requirements. Size of motor is increased from 5000 to 8000 hp. by replacing armature copper with greater cross-section.—Page 1093.

* * *

Cheap labor may prove expensive in the long run. So many fears about the competition of cheap labor have proved groundless that wise employers generally have come to believe that labor is worth about what one pays for it.—Page 1116.

* * *

Cuts production costs and improves quality of enameled wire by using a vertical-tube electrical furnace. Wire is fed from spools arranged on a suitable rack mounted to the back of the oven. Four coats of enamel are baked on.—Page 1105.

* * *

Adopt a wage incentive system and you will eliminate the waste of having unskilled work done by skilled men. Cost consultant estimates that in a jobbing foundry this system will make a net saving of over 20 per cent.—Page 1114.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

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This Year and Next

ALREADY thought begins to turn to the new year —what it will bring in volume of steel demand. Such looking forward is stimulated by recently declining production and the unlikelihood, according to precedent, that there will be an upturn in the remainder of this year. Hope must be centered on next year.

Naturally the first thing to do is to appraise this year, to determine how far it may be used as a basis for the future; and difficulty is at once encountered. This has been an anomalous year. It showed 18 per cent gain in first-half production over the previous record, which is too big a jump to be considered permanent; the peak rate in production came two months later than usual; the familiar summer dip was replaced by a very slow and continuous decrease, and there has not been the usual autumn rise.

One can find in the past no satisfactory parallel for this performance. Statistically, 1923 appears to afford a parallel, for it showed peak production in April and monthly decreases thereafter through December, but marketing conditions were different. That year belonged to the old regime of price advances, forward buying and the carrying of stocks by steel consumers. This year there were no deliveries to be accepted and put in stock to take advantage of old and lower prices. In 1927 the second half was poor throughout. In all other years after 1923 there was a dull summer with an autumn recovery.

Some assistance in gaging this year is gained by a comparison between industrial activity in general and steel production in particular. Was there a divergence in steel, and if so does the divergence promise to be permanent? The Federal Reserve Board compiles a monthly index of industrial production, manufacturing and mining. The board's base is 1923-4-5, and computing ingot production relatives according to the same plan we find that the first eight months of this year ran 16 per cent above the 1923-4-5 relation to industrial production, which seems somewhat suspicious; but going back one finds that 1928 ran 9 per cent high, and that 1927 showed an even balance. Thus the higher proportion of steel production to general activity has some measure of permanence in it, though it cannot be regarded as fully established.

In few lines of steel consumption this year was there anything really unusual or abnormal. Automobile production during the first eight months was phenomenal and line pipe demand was exceptional. But little of this year's demand can be picked out as definitely unlikely of duplication next year. There was, however, an unusual combination of favorable circumstances and these might not all hit together next year.

There is one favorable point for next year. All precedents indicate that each year takes a fresh start, a poor ending of the previous year being no handicap. Apparently if a year ends poorly demand accumulates, while if it ends well the momentum is held and some accretion is furnished. Consulting the statistics, one finds that each of the four years 1924 to 1927, inclusive, had a March peak, with ingot production lying between 161,000 and 170,000 tons daily, whereas the preceding Decembers had shown the following widely different rates: 114,531, 137,279, 152,728, 133,337 tons.

Cheap Labor Not So Cheap

OUTCRIES have been heard recently from certain labor leaders that so much American capital is being invested in European factories that it will eventually mean the importation of automobiles, radios, farm equipment and other products made more cheaply abroad by virtue of cheaper labor, and to the disadvantage of our own workingmen. How such an inflow of products can surmount our tariffs, which so far have protected our industries against unfair competition, and which will undoubtedly be maintained, is not stated.

Without denying that there are combinations of natural resources, climate and over-population which tend to pauperize the inhabitants, it should be remembered that so many fears about the competition of cheap labor have proved groundless that wise employers generally have come to believe that labor is worth about what one pays for it. In our own country, for instance, the presence of a large colored population, first slave, then free, caused grave concern to thoughtful people in both South and North. Today it is well understood that this mass of backward humanity exercised a sinister influence on the white population and the general progress of the South. Only in recent years has it been surmounted, and what does a traveler in the Birmingham district find today? Expensive automatic machinery being installed to replace the mythical cheap Negro labor. With common labor at $3 for eight hours, skilled labor $4 to $5, and best molders on piece rates earning $7 to $8, a Southern plant is bound to mechanize if it is to continue production.

A pipe foundry will thus spend $2,500,000 to develop a method of centrifugal casting which converts the whole foundry into a complicated machine. A fittings manufacturer will install completely automatic units for molding, pouring, cleaning and delivery to

inspectors at the rate of one mold per worker per minute. A steel producer will replace four scattered blast furnaces with two new ones, surrounded by so many labor-saving devices that the two new ones will use only as much labor as one of the old ones.

Such are the conditions we find when backward labor becomes reasonably well civilized. The situation which existed some generations prior to that time is illustrated in the new Central African copper region. The Union Minière, with rich ore, produces hardly one-third the copper that comes from the lean ores in Arizona; yet it employs more workers than all the Arizona mines put together. Why should an African Negro work? He can get everything he really needs and actually wants from the jungle without working, and it takes generations of association with higher standards of living before the Negro begins to hanker after the comforts and luxuries with which the white man surrounds himself. Experience on the Rand is repeating itself in Rhodesia that mining costs are higher because labor is cheaper. Consequently, the new districts seriously consider bringing in expensive white labor to operate mines and smelters in a land well populated with pauperized blacks.

It may be objected that conditions in Ireland or France cannot be compared directly with those of Katanga. But the latter illustrates the principle at the limit, as the mathematician would say. European labor may be more fairly compared with the white mill operatives in Tennessee and North Carolina. Even there, the employers are finding that textile factories, built to exploit "cheap" labor, are hardly operating before they face an insistent demand for shorter hours, better rates, cheaper housing, and all the other elements that constitute an enlightened labor policy and a prosperous, contented public which consumes the articles their machines can manufacture.

Old Automobiles as Scrap

"LET your old car apply as first payment on a new one," an advertising and sales promotion slogan used in one form or another by nearly all automobile companies, has become a boomerang. This turning in of old cars, together with many cases of excessive trade-in allowances, has created a used car problem of such magnitude that automobile manufacturers generally are now taking note of it, though it was once regarded as exclusively a dealers' matter.

About 2,500,000 automobiles become obsolete every year; but that does not mean that all of them go out of existence. Many old automobiles, which naturally should seek the scrap heap, are rejuvenated so that they will run further, and are sold over and over again or traded in for new cars or other used cars which have more life in them.

Some time back the story was repeatedly told of old automobiles taken from scrap dealers' yards and turned in as part payment on new cars, with allowances of from $200 to $300, whereas as scrap they would not be worth $25.

In various sections of the country the abandonment of worn-out cars at the roadside has created problems for municipalities. The borough of Queens, New York, was in disturbance lately over the thousands of such old wrecks that were cluttering up the landscape and that cost the city government a large sum to haul away to dumps. A city scrap yard was one plan proposed to meet the situation.

In several cities the automobile dealers have banded together to establish their own scrap yards, agreeing that all cars of a certain age shall not be resold but shall go to the scrap heap. These efforts are being watched closely by the National Automobile Chamber of Commerce and by individual automobile manufacturers as pointing the way to the best organized handling of the wrecking of old cars.

Old automobile scrap also presents a problem for steel manufacturers. If properly prepared and segregated, it is usable in the blast furnace and in the open-hearth furnace; but when mixed with other and better grades of scrap, as frequently happens, it dilutes the value of the latter. When alloy steel parts are included in the mixture, the trouble caused to the steel plant operator is sometimes serious, since it is impossible to get rid of some alloys in the open-hearth furnace. If, however, these alloy steels are properly segregated and their analyses known, the use of some of them becomes possible.

The situation calls for concerted effort on the part of the automobile industry, the scrap industry and the steel scrap consumers. Old material dealers at present sees no great profit in scrapping old automobiles because of the expensive equipment required to do the work properly and the comparatively low prices at which this grade of scrap must be sold. If such scrapping were done on a large scale, with the cooperation of the automobile industry, the scrap trade and the steel companies, much good would result.

The automobile industry would benefit by the reduction in number of used cars on the market. Steel makers would gain by a more careful preparation of automobile scrap, and a great deal of old material now going to waste would be conserved for remelting, thus creating a larger open market supply of usable scrap and stabilizing prices at levels which would permit the maximum use of old material in steel furnace mixtures. Moreover, many municipalities would be relieved of a problem that may eventually react unfavorably on the automobile industry, which, rightly or wrongly, is often charged by public officials with some responsibility for cluttering of roadways with automobile wrecks.

Changing Tides in Industry

SIGNIFICANT of the changes over the years which have brought metal manufacturing to the fore is the story told in a review of industrial development in Indiana, which has been published by the Bureau of Business Research, Indiana University. An outstanding feature is a series of tables showing the ten leading industries at a succession of dates, beginning with 1860 and closing with 1925. To some degree the great steel plant at Gary may have unbalanced the showing for metals, but the remaining factors in the State's metal-working industries probably show a typical development.

Metal-working in 1860 was represented among the ten leading industries by foundry and machine shop products, in fifth position, and agricultural implements, in eighth position. The two together accounted for products amounting to $2,280,000, while the leading

industry (flour and meal) reported products valued at $17,338,000.

This may be contrasted with the ten leading industries of 1925, all but two of which—the fourth and fifth—are metal-working. Iron and steel works and rolling mills head the list, followed by motor vehicles, foundry and machine shop products, slaughtering and meat packing, furniture, electrical machinery, iron blast furnaces, electric and steam railroad cars, steam railroad repair shops, motor vehicle bodies and parts. The tenth item in the 1925 showing had more than three times the value of product reported for the first item in 1860.

Gradual displacement of the leading items in the earlier years is traced from one list to the next as successive decennial periods yielded their returns. The flour and grist-mill products remained in first position through 1890 and were in second position in both 1900 and 1910. But they do not appear at all among the ten leading industries of 1925. Slaughtering and meat packing held first position in 1900 and 1910, dropping to fourth in 1925.

Iron and steel first entered the list in 1870, in ninth place, advancing to sixth in 1880, disappearing altogether in 1890, so far as the first ten items are concerned, reappearing in 1900 as fifth item (a position retained in 1910) and, as indicated above, taking first place in 1925, owing largely to the great concentration of iron and steel making in the northwest corner of the State.

Automobiles first became prominent in 1910, in seventh position. They held second position in 1925, while bodies and parts in tenth position should be added to the volume of manufacture of automotive units. These two items together, however, would not have displaced the steel works and rolling mills from first rank.

Taking the total value of product in 1860, metal-working represented only 6.8 per cent of the $33,379,000 aggregate output of the ten leading manufacturing industries in that year. In 1925, when the aggregate output of the ten leading industries was $1,045,155,000, metal-working constituted 83.5 per cent of the total. In the interim the metal-working percentage had shown a consistent gain—to 9½ per cent in 1870, 22½ in 1880 and 1890, 26½ in 1900 and 40½ in 1910. During the 65 years the output of metal-working plants among the ten leading industries had multiplied by 382, compared with an increase only 39-fold for the two items apart from metal-working which were in the 1925 list of the first ten lines of industry.

A Unique Presidential Address

Mr. Hoover Glorifies Scientific Research as a Potent Impulse to Progress

PRESIDENT HOOVER made a notable address at Dearborn, Mich., Monday evening, Oct. 21, when many leading Americans were guests of Henry Ford in celebrating the 50th anniversary of Thomas Alva Edison's invention of the incandescent electric lamp and in dedicating the Edison Institute of Technology, the gift of Mr. Ford.

What the President said in tribute to Mr. Edison and in appraisal of the world's debt to him was on a high plane. Of especial interest to IRON AGE readers are the President's views of the relation of research to progress in pure science and the industrial arts—a subject in which he has taken the deepest interest since he entered public life. His fruitful activity in behalf of the National Research Fund gives emphasis to these passages from his Dearborn address, which in their scientific understanding are unique among the utterances of our presidents:

"In making this, as in his other great inventions, Mr. Edison gave an outstanding illustration of the value of the modern method and system of invention, by which highly equipped, definitely organized laboratory research transforms the raw material of scientific knowledge into new tools for the hand of man. * * *

"Mr. Edison, using organized, systematic laboratory research, has been one of the great leaders who have converted the pure physics of electricity into a taxable product. Today the governments of the world levy upon upward of sixty billions of new wealth founded upon electricity.

"But the taxes and new wealth are not the major accomplishments of the men of this genius. These are the rivers of sweat saved from the backs of men and the infinite drudgery lifted from the hands of women.

"I may emphasize that both scientific discovery and its practical application are the products of long and arduous research. *Discovery and invention do not spring full grown from the brains of men. The labor of a host of men, great laboratories, long, patient, scientific experiment build up the structure of knowledge; not stone by stone, but particle by particle.* This adding of fact to fact some day brings forth a revolutionary discovery, an illuminating hypothesis, a great generalization, or a practical invention.

"Research both in pure science and in its application to the arts is one of the most potent impulses to progress. For it is organized research that gives daily improvement in machines and processes, in methods of agriculture, in the protection of health, and in understanding. From these we gain constantly in better standards of living, more stability of employment, lessened toil, lengthened human life and decreased suffering. *In the end our leisure expands, our interest in life enlarges, our vision stretches. There is more joy in life.*

* * * "Our scientists and inventors are among our priceless national possessions. *There is no sum that the world could not afford to pay these men who have that originality of mind, that devotion and industry to carry scientific thought forward in steps and strides until it spreads to the comfort of every home.*"

* * * "Not by all the profits of all the banks in the world can we measure the contribution which these men make to our progress. Their discoveries are not the material for headlines. Their names are usually known to but a few. But the nation owes them a great honor and is proud to demonstrate through Mr. Edison today that their efforts are not unappreciated. The country can well pay its tribute to the men of this genius by expanding the facilities for their labors. The nation today needs more support to research. It needs still more laboratories."

Southern Metal Trades Hold Annual Convention

John S. Schofield, president of the J. S. Schofield's Sons Co., Macon, Ga., was elected president of the Southern Metal Trades Association at its eleventh annual convention at Knoxville, Tenn., Oct. 16 and 17. Paul R. Moore, Columbus Iron Works Co., Columbus, Ga., was named first vice-president; W. G. Mealor, Gainesville Iron Works, Gainesville, Ga., treasurer; and William E. Dunn, Jr., Atlanta, secretary.

George B. Cocker, Cocker Machine & Foundry Co., Gastonia, N. C., who retired as president of the association, was presented with a handsome silver service by the members in appreciation of his services. Mr. Moore led the discussion on the subject of costs at the business session. The convention closed with a visit to the plant of the Aluminum Co. of America near Knoxville.

Meetings of American Electrochemists

For the annual spring meeting of the American Electrochemical Society to be held in St. Louis, May 29 to 31, 1930, a symposium on hydroelectrometallurgy is scheduled. The chairman is T. H. Donahue, research engineer, Anaconda Lead Products Co., East Chicago, Ind. The symposium will cover copper, zinc, lead, cadmium, bismuth, silver, etc. There will also be sessions on refractories, rectifiers and the plating of rare metals.

A visit to a new electrolytic zinc plant and other industries in and around St. Louis, as well as an all-day excursion to the lead mines through the beautiful Ozark Mountains, are on the program. The headquarters will be at the Hotel Coronado.

Future conventions of the society are announced as Detroit in the fall of 1930; Birmingham, Ala., in the spring of 1931, and Salt Lake City in the fall of that year.

Index for Industrial Use of Electricity Rises

Industrial consumption of electricity in the United States, according to the *Electrical World* index, was 135.8 in September, compared with 128.2 in August and with 134.5 in September of last year. The index is based upon electrical energy consumption by 3600 scattered manufacturing plants, their average in 1923-1925 being 100.

The metal industries group advanced from 140.7 to 149.2. Both components showed an increase, that for rolling mills and steel plants going from 150.9 to 152.3, while metal-working plants, ferrous and non-ferrous, advanced from 134.6 to 147.4. Automobiles, including parts manufactured, declined from 143 to 138.1. Shipbuilding showed a large advance, from 96.3 to 114.9.

The Week in Business

Drift of Current Financial and Economic Opinion

STOCK market deflation has proceeded further, following a brief interruption in the second week of the month. The main cause for the decline, according to Col. Leonard P. Ayres, is an excessive accumulation of undigested securities. "For months past," he says, "the outpourings of new securities have been enormous, and finally the public ceased to take the new issues with the avidity they had shown earlier."

The large-scale flotation of securities has a definite connection with the high level of brokers' loans, in the opinion of Alexander D. Noyes, New York *Times*. In the face of stock market liquidation, there has been an increase of $400,000,000 in brokers' borrowings in New York alone since Sept. 1, on top of a billion dollar expansion in the preceding three months. Such a picture, says Mr. Noyes, raises the question whether a great part of the year's new issues have not remained unsold and carried along on brokers' credit, in first or second hands.

Reduction in "Outside" Loans Throws Burden on Banks

The gain of $88,000,000 in brokers' loans last week nearly wiped out the reduction of the previous week, bringing the total to within $3,000,000 of the record peak. A new feature of the latest increase was that it was supplied by the banks and that loans from "others" declined. In the view of Benjamin Baker, *Annalist*, "the figures show again the banking danger which made its appearance so emphatically at the beginning of the year—namely, that with any withdrawal of "others" loans the member banks and the Reserve banks would have to take up the load as the only means of avoiding a money disturbance of greater or less severity."

The fact that "stocks tumbled badly" last week with call rates relatively easy is interpreted by *Commercial and Financial Chronicle* as demonstrating that the course of the money market does not control the course of the stock market. On the other hand, the Harvard Economic Society sees the possibility of easier money again "stimulating speculative activity, as it usually does." But it does not expect more than a moderate easing of credit under the present Reserve policy, which is unlikely to be changed unless serious business recession threatens.

Signs of Moderating Business Pace

While general business has definitely moderated, it is still high in comparison with previous autumns. Symptoms of slackened activity are seen in a decline in commodity prices and an expansion of commodity stocks, which, however, are not seriously large except in a few lines. Bank debits and export trade have failed to show their usual seasonal gain, says the Harvard Economic Society, important branches of manufacturing have slowed up, and building remains in reduced volume.

Both building and foreign trade are expected to benefit from securities deflation. The outlook for residential construction is steadily improving, in the opinion of Standard Statistics, because, under money conditions of the past year, demand has been catching up with supply. Betterment in the capital market of the outside world, according to advices from abroad, is regarded as the logical sequel of the withdrawal of European funds from New York and renewed American interest in fixed-return securities.

Sees Stocks Back on Sound Basis

A sanguine view of the present status of business and of stocks is taken by Charles E. Mitchell, chairman of the National City Bank of New York, as quoted in a London message to the New York *Times*. "All the basic industries are doing satisfactorily and, unless something unforeseen occurs, should continue to do so," he said. The shakedown of stock prices has brought "many leading industrial securities to levels which would have been considered perfectly sound and conservative even by the standards of 10 years ago."

Iron and Steel Markets

Good Bookings in Ship Steel and Rails

Rail Orders Account for 563,000 Tons and Vessels for 105,000 Tons—Inquiries for 25,000 Freight Cars in Prospect —Motor Car Outlook Still Uncertain

THE week's news has accentuated the contrast between the reduced steel requirements of the automobile industry and the sustained demand from other sources.

Rail orders have added 563,000 tons to mill books and shipbuilding contracts will account for 105,000 tons. Structural steel awards for the week are high, totaling 58,000 tons, compared with 23,000 tons in the preceding week. Freight equipment purchases so far in October call for 20,000 cars, or 28 per cent of the total number bought in the first nine months of the year, and orders for 25,000 additional cars are in prospect.

Farm implement manufacturers are stepping up production of spring tools and will soon be operating at a peak rate. The entering of orders for tin plate, following the impending announcement of next year's price, will enable mills that are not now working on anticipated tonnage to increase their production.

Steel mill operations show wide variations, depending on the extent to which different finished products are used in the motor car industry, but steel ingot output has undergone little further reduction. Some independents are making raw steel at the rate of 70 per cent, or even less, but the Bethlehem Steel Corporation is operating at 82 per cent and the United States Steel Corporation average remains at 80 per cent.

The view is gaining ground that production has struck bottom. In the Valley district, which ships more steel to the automobile industry than any other producing center, ingot output is down to 70 per cent, but no further curtailment is looked for. In the Pittsburgh area crude steel production is being maintained at an 80 per cent rate and rail mill operations are being increased. At Chicago the tardiness of rail specifications has caused the temporary banking of a steel works blast furnace.

Scrap markets are inactive, but the downward trend of prices has been arrested, with heavy melting grade unchanged at Pittsburgh for a second week. Pig iron melt is well sustained except among foundries serving the automotive industry. In fact, Cleveland reports an increase in pig iron shipments, notably to manufacturers of heating equipment. Good operations among steel foundries reflect the influence of railroad equipment buying.

The outlook in the automobile industry remains uncertain. Production of new models is being delayed until large stocks of present models, both in manufacturers' and dealers' hands, are disposed of. The sale of used cars is also a problem, although in some sections distributers' stocks have been reduced materially.

With the steel industry adjusting itself to the slump in automotive requirements, the price situation gives signs of clarifying. At least changes of the past week were not significant, being limited to recognition of recent concessions or to the readjustment of quotations on certain products to bring them into line with others. Thus wire nails, which have lacked stability for some time, now range from $2.40 to $2.50 a keg, Pittsburgh, the lower figure representing a decline of $1 a ton from the previous minimum open quotation. At Chicago, bars and shapes have been reduced $1 a ton, following frequent shading of the former price. A decline in metal furniture sheets to a flat price of 4.10c., Pittsburgh, is in sympathy with prior reductions in commoner finishes.

Shipbuilding is looming up as a more important outlet for steel. Two Dollar line vessels have been placed with the Newport News Shipbuilding & Dry Dock Co., and six tankers have been awarded—two for the Sinclair company to the Bethlehem Shipbuilding Corporation, two Standard Oil Co. vessels to the Federal Shipbuilding & Dry Dock Co., and two for the Tidewater Oil Co. to the Sun Shipbuilding & Dry Dock Co. These vessels, together with two merchant ships to be placed this week, will require close to 105,000 tons of steel. Six car floats, ordered by the Reading Co., will call for 3500 tons of plates and shapes.

Railroad equipment business recently closed, together with that which will probably be placed in the next two months, will give most freight car builders a substantial backlog of work for the early months of 1930. The Pennsylvania has bought 1000 steel box cars from the Bethlehem Steel Corporation, and the Burlington has entered the market for 600 cars out of a total of 2700 to be inquired for.

The week's awards of fabricated steel included 17,500 tons for the Cornell Medical Center, New York, and 16,000 tons for a Pennsylvania Railroad station at Philadelphia. Of 38,000 tons of new work that came into the market, 15,000 tons is for a Chicago tower building. Conspicuous among prospective projects is a 100-story building in New York for the Metropolitan Life Co., which will require 30,000 to 40,000 tons of steel.

THE IRON AGE composite price for pig iron has advanced from $18.29 to $18.38 a gross ton. The finished steel composite remains at 2.369c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Oct. 22, 1929	Oct. 15, 1929	Sept. 24, 1929	Oct. 23, 1928
No. 2 foundry, Philadelphia	$21.26	$21.26	$21.26	$21.76
No. 2, Valley furnace	18.50	18.50	18.50	17.00
No. 2 Southern, Cin'ti	**17.69**	17.19	17.19	19.94
No. 2, Birmingham	14.50	14.50	14.50	16.25
No. 2 foundry, Chicago*	20.00	20.00	20.00	19.00
Basic, del'd eastern Pa	19.75	19.75	19.75	19.75
Basic, Valley furnace	18.50	18.50	18.50	17.00
Valley Bessemer, del'd P'gh	20.76	20.76	20.76	19.26
Malleable, Chicago*	20.00	20.00	20.00	19.00
Malleable, Valley	19.00	19.00	19.00	17.50
Gray forge, Pittsburgh	19.76	19.76	19.76	18.26
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	105.00
Rails, Billets, Etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	35.00	35.00	35.00	33.00
Sheet bars, Pittsburgh	35.00	35.00	35.00	33.00
Slabs, Pittsburgh	35.00	35.00	35.00	33.00
Forging billets, Pittsburgh	40.00	40.00	40.00	38.00
Wire rods, Pittsburgh	40.00	40.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.90
Finished Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.90	1.90	1.90	1.90
Bars, Chicago	*2.00*	2.05	2.05	2.00
Bars, Cleveland	*1.90*	1.95	1.95	1.90
Bars, New York	2.24	2.24	2.24	2.24
Tank plates, Pittsburgh	1.95	1.95	1.95	1.90
Tank plates, Chicago	2.05	2.05	2.05	2.00
Tank plates, New York	2.22½	2.22½	2.22½	2.22½
Structural shapes, Pittsburgh	1.90	1.90	1.90	1.90
Structural shapes, Chicago	*2.00*	2.05	2.05	2.00
Structural shapes, New York	2.14½	2.14½	2.19¼	2.19½
Cold-finished bars, Pittsburgh	2.30	2.30	2.30	2.20
Hot-rolled strips, Pittsburgh	1.90	1.90	1.90	1.90
Cold-rolled strips, Pittsburgh	2.75	2.75	2.75	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel,	Oct. 22, 1929	Oct. 15, 1929	Sept. 24, 1929	Oct. 23, 1928
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.75	2.75	2.85	2.75
Sheets, black, No. 24, Chicago dist. mill	2.95	2.95	2.95	2.85
Sheets, galv., No. 24, P'gh	3.50	3.50	3.50	3.50
Sheets, galv., No. 24, Chicago dist. mill	3.60	3.60	3.60	3.60
Sheets, blue, No. 13, P'gh	2.35	2.35	2.35	2.10
Sheets, blue, No. 13, Chicago dist. mill	2.45	2.45	2.45	2.20
Wire nails, Pittsburgh	*2.40*	2.45	2.45	2.55
Wire nails, Chicago dist. mill	2.45	2.45	2.50	2.60
Plain wire, Pittsburgh	2.40	2.40	2.40	2.40
Plain wire, Chicago dist. mill	2.40	2.40	2.45	2.45
Barbed wire, galv., P'gh	*3.05*	3.10	3.20	3.20
Barbed wire, galv., Chicago dist. mill	3.15	3.15	3.30	3.25
Tin plate, 100 lb. box, P'gh	$5.35	$5.35	$5.35	$5.25
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$17.25	$17.25	$18.00	$18.00
Heavy melting steel, Phila	15.50	15.50	16.00	16.00
Heavy melting steel, Ch'go	14.25	14.25	15.00	14.00
Carwheels, Chicago	14.00	14.00	14.00	13.75
Carwheels, Philadelphia	16.50	16.50	16.50	16.50
No. 1 cast, Pittsburgh	15.50	15.50	15.50	15.50
No. 1 cast, Philadelphia	16.00	16.00	16.00	17.00
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.50	15.50
No. 1 RR. wrot., Phila	16.00	16.00	16.00	15.50
No. 1 RR. wrot., Ch'go (net)	14.00	14.00	14.00	12.75
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$2.65	$2.65	$2.65	$2.90
Foundry coke, prompt	3.75	3.75	3.75	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	18.12½	18.12½	18.12½	15.62½
Electrolytic copper, refinery	17.75	17.75	17.75	15.25
Tin (Straits), New York	*41.37½*	42.25	45.25	48.75
Zinc, East St. Louis	*6.70*	6.80	6.80	6.25
Zinc, New York	*7.05*	7.15	7.15	6.60
Lead, St. Louis	6.70	6.70	6.70	6.32½
Lead, New York	6.90	6.90	6.90	6.50
Antimony (Asiatic), N. Y.	**8.75**	8.50	8.62½	10.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Reduced Requirements of Automobile Industry Only Flaw in Steel Demand—Operations at 80 Per Cent

PITTSBURGH, Oct. 22.—If it were not for the reduced requirements of the automobile industry, steel demand in this and nearby districts would be considered about normal for this time of the year. It might be somewhat less than it was last October, which was a month of unusually heavy activity in many steel-consuming industries, but was not a period in which the automobile makers accounted for as large a percentage of steel shipped as they did in the first six months of this year.

The placing of heavy rail tonnages in the last week improved sentiment in the market somewhat, although these orders were scarcely 5 per cent ahead of placements last year by the same railroads. The rail mill in the district is already stepping up its schedules, and diversion of steel to this use will perhaps reduce the amount of semi-finished steel which might be offered for sale.

Steel orders from car builders are being received by local sheet and plate mills, and a survey indicates that shops served by steel makers in the Pittsburgh district have secured enough business from the recent buying movement to keep them well occupied until the second or third month of next year.

Agricultural implement makers are taking steel in increasing quantities, and, in gaging the implement demand for next year on which they are now beginning to work, they do not expect curtailed buying from the farmers in any districts except possibly parts of Western Canada.

Next year's price on tin plate is expected to be announced within the next two or three weeks and the entering of orders at that time will enable mills which are not already working on anticipated tonnage to increase production in that department. Structural demand is not heavy in this particular locality, but fabricating shops are fairly well engaged. Barge builders are now completing orders booked earlier in the year, but prospective business in both barges and self-propelled river craft is encouraging.

Steel plant operations have not changed materially in the last week. Slight improvement in some departments is naturally stressed more than further curtailment in others. Ingot operations average about 80 per cent of capacity, with the larger mills making a well diversified line of products at a somewhat better rate. Some independent makers of sheets and strips are not higher than 50 per cent. Sheet mill operations, as a whole, are at 70 to 75 per cent, while strip mills average between 50 and 60. Pipe mills have been slowed down slightly this month.

Present prices are holding and recent reductions have clarified the situation and probably have led to the placing of considerable tonnage which had been held in abeyance.

Wire nails have been reduced $1 a ton and are now quoted at $2.40, Pittsburgh, to large buyers and at $2.50 in carload lots. Wire prices are

unchanged, with 2.40c. a lb. generally quoted for manufacturers' wire. Bars and shapes are still quotable at 1.90c. to 1.95c., Pittsburgh, and, although the lower figure is not applying on much plate tonnage in this territory, reports of shading are common in the East.

Pig Iron.—The market continues very dull so far as sales or inquiries for large tonnages of iron are concerned. Local sellers are taking orders regularly for lots of two or three carloads, and foundries in the district are evidently buying iron only as they actually need it. Prompt shipments are readily obtainable from nearly all the Valley and local furnaces, and, with prices subject to little or no shading, there is no incentive to cover against future wants. The steel foundries in the district are operating at a good rate, and shipments to them are heavy. The same cannot be said of the sanitary ware and radiator makers, whose wants are limited. The largest maker of sanitary ware does not expect to buy any large tonnages of iron before the first of the year, although some small lots may be purchased to fill out. Prices are unchanged at $18.50, Valley, for basic and foundry iron, and $19 for malleable. The local furnace is quoting prices 50c. higher.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.00

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Semi-Finished Steel.—The market is without feature, as there is little or no spot inquiry for semi-finished steel, and most non-integrated steel companies have covered their requirements for this quarter by contract. A few companies, which are not ordinarily large sellers of billets, slabs and sheet bars, are making rather active efforts to dispose of surplus tonnage, but users of these products are limited and the majority of them have definite sources of supply from whom they seldom divert their tonnage. The price situation seems reasonably firm, with $35 the ordinary quotation on billets, slabs and sheet bars, and $40 on forging billets. Wire rods are holding at $40, Pittsburgh or Cleveland, and there is little activity.

Rails and Track Accessories.—Both the Pennsylvania and New York Central rail tonnages were placed during the last week, the Pennsylvania having ordered 310,000 tons and the New York Central 206,430 tons. The Erie Railroad has placed 46,460 tons of rails. Distribution of these orders is given elsewhere in this issue. The Erie has not yet placed its track accessories, nor has the New York Central. The Pennsylvania track accessories are bought quarterly. The Pere Marquette is reported to have closed on 5000 tons of tie plates.

Bars, Shapes and Plates.—Business in the heavy hot-rolled products has changed very little in the last three weeks, but sentiment in the market has improved somewhat, and a few companies reported slightly better specifications on bars. Structural awards in this district are not heavy, but fabricating shops are fairly well engaged and there is enough work in prospect to insure a fairly good business for the remainder of the quarter. Specifications for plates to cover recent car awards are not yet reaching mills in this district in heavy amounts, but this business is bound to be placed in the near future and will improve mill backlogs materially. Prices are still subject to shading, but there is no indication that less than 1.90c., Pittsburgh, is being done on either bars or shapes. Plates are holding better in this district, although there are reports of lower prices in the East.

Wire Products.—Makers of wire and wire nails have announced new prices, effective immediately, and are now quoting nails at $2.40 to $2.50 per keg, Pittsburgh, the range depending on the size of the jobber. This is a decline of $1 a ton from recent levels. Manufacturers' wire is now quoted at 2.40c., Pittsburgh base, while quotations to jobbers on bright plain wire, No. 6 to 9 gage, are unchanged at 2.40c. to 2.50c., Pittsburgh. With the $3 extra for annealing, this makes a price of 2.55c. to 2.65c., Pittsburgh, for annealed fence wire, which constitutes the largest part of the jobbers' tonnage. Business is rather quiet, but recent changes are expected to clarify the price situation somewhat. Demand for manufacturers' wire has been influenced adversely by the decreased automobile production, but this is expected to show some improvement next month.

Tubular Products.—The inquiry for 300 miles of 4, 6 and 8-in. line pipe, which was reported last week, is now thought to have been confused with an inquiry for 50 miles of 6-in. and 50 miles of 8-in. pipe, on which the prospective buyer asked for prices on three types of end finishes. This inquiry also included a few miles of 4-in. pipe. Otherwise inquiry for line pipe is quiet and demand for seamless goods from the oil country is not heavy. Movement of butt-weld pipe is receding seasonably, but mills are still fairly well engaged. Mechanical tubing is quiet, but there is a better call for boiler tubes.

Sheets.—If it were not for the automobile industry, the sheet business would be considered excellent for this time of the year, as other important consuming industries are taking tonnage at a satisfactory rate. Heavier specifications for blue annealed and galvanized sheets are expected from the railroad car builders in a short time, and if the automobile industry begins to come back next month the quarter may prove to be a more satisfactory one than was anticipated a few weeks ago. At present, demand from the automotive industry is negligible, but the Ford Motor Co. has begun to place specifications for November shipments and others are expected to follow suit in a short time. It is worthy of note that the Ford specifications do not indicate any marked model changes. Sheet prices are becoming better established at recent reduced prices. Black sheets are now quotable at 2.75c., Pittsburgh, as the

The Iron Age Composite Prices

Finished Steel

Oct. 22, 1929, 2.369c. a Lb.

One week ago	2.369c.
One month ago	2.384c.
One year ago	2.362c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High	Low
1929	2.412c., April 2;	2.369c., Oct. 8
1928	2.391c., Dec. 11;	2.314c., Jan. 3
1927	2.453c., Jan. 4;	2.293c., Oct. 25
1926	2.453c., Jan. 5;	2.403c., May 18
1925	2.560c., Jan. 6;	2.396c., Aug. 18

Pig Iron

Oct. 22, 1929, $18.38 a Gross Ton

One week ago	$18.29
One month ago	18.29
One year ago	17.92
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
1929	$18.71, May 14;	$18.25, Aug. 27
1928	18.59, Nov. 27;	17.04, July 24
1927	19.71, Jan. 4;	17.54, Nov. 1
1926	21.54, Jan. 5;	19.46, July 13
1925	22.50, Jan. 13;	18.96, July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.90c. to 1.95c.
F.o.b. Chicago	2.00c. to 2.05c.
Del'd Philadelphia	2.22c. to 2.27c.
Del'd New York	2.24c. to 2.29c.
Del'd Cleveland	1.90c. to 1.95c.
F.o.b. Cleveland	1.90c.
F.o.b. Lackawanna	2.00c. to 2.05c.
F.o.b. Birmingham	2.10c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft	2.05c.
F.o.b. Pittsburgh mills, cut lengths	2.30c.
F.o.b. Birmingham, mill lengths	2.10c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.85c. to 1.90c.
F.o.b. Chicago Heights mill	1.95c.
Del'd Philadelphia	2.27c.

Iron

Common iron, f.o.b. Chicago	2.05c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.10c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.15c.
F.o.b. Coatesville	2.05c.
F.o.b. Sparrows Point	2.05c.
F.o.b. Lackawanna	2.05c.
Del'd New York	2.22½c.
C.i.f. Pacific ports	2.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.90c. to 1.95c.
F.o.b. Chicago	2.00c. to 2.05c.
F.o.b. Birmingham	2.10c.
F.o.b. Lackawanna	2.05c.
F.o.b. Bethlehem	2.05c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	1.96c. to 2.06c.
Del'd New York	2.14½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	2.00c.
Wider than 6 in., P'gh	1.90c.
6 in. and narrower, Chicago	2.20c.
Wider than 6 in., Chicago	2.10c.
Cooperage stock, P'gh	2.20c.
Cooperage stock, Chicago	2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.30c.
Bars, Buffalo	2.30c.
Shafting, ground, f.o.b. mill	*2.65c. to 3.60c.
Strips, P'gh	2.75c. to 2.85c.
Strips, Cleveland	2.75c. to 2.85c.
Strips, del'd Chicago	3.05c. to 3.15c.
Strips, Worcester	2.90c. to 3.00c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.25c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails	$2.40 to $2.50
Galvanized nails	4.40 to 4.50
Galvanized staples	3.10 to 3.20
Polished staples (per lb.)	2.85c. to 2.95c.
Cement coated nails	$2.40 to $2.50
	Base per 100 Lb.
Bright plain wire, No. 6 to No. 9 gage	$2.40 to $2.50
Annealed fence wire	2.55 to 2.65
Spring wire	3.50 to 3.60
Galv'd wire, No. 9	3.00 to 3.10
Barbed wire, galv'd	3.05c. to 3.15c.
Barbed wire, painted	2.80c. to 2.90c.
Woven wire fence (per net ton to retailers)	65.00

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.	$2.70
Less carloads, Wheeling or Reading	2.80

Light Plates

No. 10, blue annealed, f.o.b. P'gh	2.10c. to 2.20c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.30c.
No. 10, blue annealed, del'd Phila.	2.42c. to 2.52c.
No. 10, blue annealed, B'ham	2.35c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.25c. to 2.35c.
No. 13, f.o.b. Chicago dist.	2.45c.
No. 13, del'd Philadelphia	2.57c. to 2.67c.
No. 13, blue annealed, B'ham	2.50c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.75c.
No. 24, f.o.b. Chicago dist. mill	2.95c.
No. 24, del'd Philadelphia	3.07c.
No. 24, f.o.b. Birmingham	3.00c. to 3.10c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh	4.10c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill	3.60c. to 3.70c.
No. 24, del'd Cleveland	3.59c. to 3.69c.
No. 24, del'd Philadelphia	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham	3.75c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.00c. to 3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.00c. to 4.10c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.90c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.35
Standard cokes, f.o.b. Gary	5.45

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. makers' mill)

Alloy Quality Bar Base, 2.65c. to 2.75c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(½% Nickel)	$0.25
2100	(1¼% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bars	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plate, steel	2.15
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	*Iron* Inches	Black	Galv.
⅛	45	19½	¼ and ⅜	+11	+36
¼ to ⅜	51	25½	½	23	5
½	56	42½	¾	28	11
¾	60	48½	1 and 1¼	31	15
1 to 3	62	50½	1½ and 2	35	18

Lap Weld

2	55	43½	2	23	9
2½ to 6	59	47½	2½ to 3½	28	13
7 and 8	56	43½	4 to 6	30	17
9 and 10	54	42½	7 and 8	29	16
11 and 12	53	40½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ and ⅜	+13	+48
¼ to ⅜	47	30½	½	23	7
½	53	42½	¾	28	12
¾	58	47¼	1 to 2	34	18
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	½	29	13
2½ to 4	57	46½	2½ to 4	34	20
4½ to 6	56	45½	4½ to 6	33	19
7 to 8	52	39½	7 and 8	31	17
9 and 10	45	32½	9 to 12	21	8
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		*Charcoal Iron*	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

higher figure has practically disappeared and automobile body sheets are now at 4c., flat. Metal furniture sheets are also quotable at a flat 4.10c. Galvanized material is still quotable at 3.50c. to 3.60c., although the higher figure is gradually disappearing. Shading in blue annealed sheets has not developed to any marked extent in this district, although the wide strip mill product is quoted at $4 a ton under the regular maximum quotations of 2.35c., on the No. 13 gage jobbing mills sheets and 2.20c. on the No. 10 gage.

Tin Plate. — Operations have changed little in the last week, although the leading interest has curtailed its production slightly. The average for the independent companies is about 60 per cent of capacity. It will be two or three weeks before the 1930 price on tin plate will be announced and, in the meantime, contracting is held in abeyance.

Strip Steel.—The strip market has a firmer tone, as the demand is improving from many industries and a few companies are receiving increased specifications from the automobile makers. The Chevrolet Motor Co. has begun to place tonnage for November shipments and other smaller users will soon be back in the market. The hardware industry is now an active consumer of strip steel. Operations in the district average between 50 and 60 per cent of capacity and have improved slightly in some mills in the last week. Prices are unchanged and shading seems to be on the wane rather than on the increase. Hot-rolled material is holding at 1.90c. and 2c., Pittsburgh, and cold-rolled at 2.75c. to 2.85c.

Cold-Finished Steel Bars.—Specifications are coming in at approximately the rate which has prevailed during the month, but there are signs of improvement in some directions. The agricultural implement industry is stepping up its operations in preparation for next season's requirements and will soon be at the peak rate. This business is one of the largest consumers of cold-finished bars and, while Pittsburgh mills do not share heavily in this business, it constitutes a fair portion of their tonnage. Demand from the automobile industry has not yet begun to show much improvement. Prices are holding at 2.30c., Pittsburgh.

Old Material.—The scrap market has undergone little change in the last week, and, while at least two consumers are reported to have placed small tonnages, both sales come within the recent price range of $17 to $17.50 for No. 1 heavy melting steel. Scrap is not nearly so plentiful as it was at the beginning of the month, but dealers are having no trouble in picking up material for shipment against recent sales. Hold-ups are still in effect at two important consuming points, but steel scrap is moving more freely into other plants and it is believed by some that the market has reached bottom. Generally speaking, prices quoted last week are still representative of the market on all grades and tendencies toward strength are reported in a few lines.

Prices per gross ton delivered consumers yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$17.00 to $17.50
No. 2 heavy melting steel	15.00 to 15.50
Scrap rails	16.00 to 16.50
Compressed sheet steel	16.75 to 17.25
Bundled sheets, sides and ends	15.50 to 16.00
Cast iron carwheels	15.50 to 16.00
Sheet bar crops, ordinary	18.50 to 19.00
Heavy breakable cast	12.00 to 12.50
No. 2 railroad wrought	17.00 to 17.50
Hvy. steel axle turnings	16.00 to 16.50
Machine shop turnings	11.50 to 12.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	20.50 to 21.00
Railr. coil and leaf springs	20.50 to 21.00
Rolled steel wheels	20.50 to 21.00
Low phos. billet and bloom ends	21.50 to 22.00
Low phos., mill plates	21.50 to 22.00
Low phos., light grades	20.50 to 21.50
Low phos., sheet bar crops	21.50 to 22.00
Heavy steel axle turnings	16.00 to 16.50
Electric Furnace Grades:	
Low phos., punchings	19.50 to 20.50
Hvy. steel axle turnings	16.00 to 16.50
Blast Furnace Grades:	
Short shoveling steel turnings	12.00 to 12.50
Short mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
Rolling Mill Grades:	
Steel car axles	21.50 to 22.00
Cupola Grades:	
No. 1 cast	15.00 to 16.00
Rails 3 ft. and under	19.00 to 20.00

Coal and Coke.—The coke market is without interest and, while demand for the domestic grade is rather strong at this time, furnace coke is quiet and is feeling the reduced requirements of the steel industry. Prices seem to be showing more strength, but the market on furnace coke is still quotable at $2.65 to $2.75 per ton, Connellsville. Stronger prices are reported from the East. Foundry coke shipments are showing some improvement, but the demand is not heavy and little spot tonnage is coming into the market. Coal business still disappoints, and although reports of better prices and heavier demand come from the lower West Virginia field, the districts around Pittsburgh are not doing so well. The end of the Lake movement in a few weeks will also influence shipments adversely.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c. to 3.90c.
Galv. sheets (No. 24), 25 or more bundles	4.45c. to 4.55c.
Light plates, blue annealed (No. 10), 1 to 24 plates	3.35c. to 3.45c.
Blue annealed sheets (No. 13), 1 to 24 sheets	3.50c. to 3.60c.
Galv. corrug. sheets (No. 28), per square	$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft, ann'l'd, base per 100 lb.	$2.90 to 3.00
Wire, galv. soft, base per 100 lb.	2.90 to 3.00
Common wire nails, per keg	2.80 to 2.90
Cement coated nails, per keg	2.95 to 3.05

Jones & Laughlin Profit in Quarter $5,690,226

The Jones & Laughlin Steel Corporation, in the quarter ended Sept. 30, had net income, after deductions for depreciation, depletion, bond interest, etc., of $5,690,226. After payment of dividends on common and preferred stock, balance carried to surplus amounted to $3,366,014. Net income in the first nine months of the year amounted to $16,995,913.

The regular dividends of 1¾ per cent on preferred and 1¼ per cent on common stock were declared, as well as an extra of 1 per cent on common.

Steel Foundry Operates 45 Days Without Accident

Having won the inter-plant contest of the Chicago Safety Council for the best record in July, the Pettibone Mulliken Co., manufacturer of steel castings, is now setting out to make an even better mark in the prevention of accidents. For 45 days beginning July 1 the company did not have a lost-time accident.

By assuming its own casualty risk, the company has cut its cost of insurance from $36,000 to $11,000 yearly. A central safety committee, composed of the operating manager, plant physician and superintendents of the various departments, supervises safety. This group holds regular monthly meetings at which problems are discussed and plans mapped out for cutting down the accident rate.

Each month the committee appoints from a different department some man to act as an inspector. This employee devotes a portion of each day to a tour of the plant, inspecting safety devices, noting whether the men are taking all precautions against injury and making recommendations for changes and improvements.

Joseph T. Ryerson & Son, Inc., Chicago, has sold its line of table and floor-type horizontal boring, drilling, and milling machines to the Ohio Machine Tool Co., Kenton, Ohio, but will retain rights as exclusive distributors of the line. The Ohio Machine Tool Co., which has been building these machines for some time for the Ryerson company, will expand and improve the line.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$35.00
Rerolling, 4-in. and under 10-in., Youngstown	35.00
Rerolling, 4-in. and under 10-in., Cleveland	35.00
Rerolling, 4-in. and under 10-in., Chicago	37.00
Forging quality, Pittsburgh	$40.00 to 41.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$40.00
Cleveland	40.00
Chicago	41.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	12.00c.
Iron ore, low phos., Swedish, average 68% iron	12.00c.
Iron ore, basic Swedish, average 65% iron	10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	30.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	30.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$15.50 to $16.50

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.65 to $2.75
Foundry, f.o.b. Connellsville prompt	3.75 to 4.75
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in. f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$105.00
Foreign, 80% Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

Per Gross Ton Furnace		Per Gross Ton Furnace	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$22.00 to $23.00	10%	$26.00 to $28.00
7%	23.00 to 24.00	11%	28.00 to 30.00
8%	24.00 to 25.00	12%	30.00 to 32.00
9%	25.00 to 26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd	$1.40 to $1.50
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.25 to $18.75
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including 1 in. x 6 in take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh	75, 20, 10 and 5
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2½
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.10
F.o.b. Chicago	3.20

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85
Upset hex. cap screws, S.A.E. thread	85
Upset set screws	80, 10 and 5
Milled studs	70

Chicago

Bar and Shape Prices Settle to Minimum of 2c.—Rail Orders Only Feature of Buying

CHICAGO, Oct. 22.—Both sales and new offers to consumers in this district establish prices for mild steel bars and structural shapes at 2c. to 2.05c. a lb., Chicago. This price situation is somewhat a reflection of a market which is gradually becoming quieter in sales and consumption of steel. New business, largely influenced by rail orders, averages well with purchases in recent weeks, but the fact that rail business is heavy serves to stress the slackened demand for plates, shapes and bars. Specifications for steel mill products are the best since mid-March, but fully one-half of the tonnage released is for rails and a large share of the remaining 50 per cent is for car material, leaving little tonnage that will be taken by miscellaneous consumers, including fabricating shops. Chicago mills participated to the extent of over 200,000 tons in a rail-buying movement which brought the total placed in the week to well over the 500,000-ton mark.

Notwithstanding that heavier-than-usual rail purchases have been made earlier than is customary and that some shipping schedules have already been arranged, actual releases are being held in check and rail mill output has not gained as was expected by producers.

Lack of immediate shipping instructions for rails, together with light demand for steel in other directions, has necessitated curtailment in blast furnace output. No. 7 stack at Gary has been banked. The leading producer is now operating 16 of its 27 furnaces, and for the district as a whole there are 25 steel mill stacks in blast of a total count of 36. Two stacks are banked in the hope that business will soon warrant putting them in blast in the near future.

New railroad equipment inquiries include 600 cars for the Burlington. The trade is expecting inquiries from the Missouri - Kansas - Texas, Cotton Belt and Chesapeake & Ohio.

Plate and shape business developing in Oklahoma includes 11,000 tons for tanks and 7500 tons for buildings and bridges.

Ferroalloys.—This market, viewed from all angles, is quiet. It is reported that 50 per cent ferrosilicon contracts will be offered by the middle of November.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $88.50; spiegeleisen, 19 to 21 per cent, $39.76 to $41.76.

Sheets.—Output in this district remains at close to 85 per cent of hot mill capacity. New buying by the bulk of consumers is still for nearby needs and in the aggregate it is still about equal to shipments. New specifications, which usually are entered at mills at time of purchase, amply support the current rate of output. Backlogs are small and stationary. Lighter commitments for blue annealed sheets have brought deliveries to the range of three to four weeks, and mills that six weeks ago were out of the market with heavy order books are now actively seeking tonnages for delivery about the middle of November. Prices in and near Chicago and the Northwest are holding.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3c.; No. 24 galv., 3.65c. to 3.75c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Pig Iron.—Prices for silvery iron have given away $1 a ton on recent sales in this market. Shipments are at the low point of the year and new business is scarce, thereby leading to unusually keen competition. The Northern iron market in and around Chicago remains steady at $20 a ton, furnace. Shipments are well up to the average of September, and practically the full output of local furnaces is moving to melters. Forward buying is practically at a standstill, but spot purchases are at a high fall level. Demand for malleable iron is on the upturn, as use of malleable castings on railroad equipment absorbs some of the slack in melt made necessary by the curtailment in automobile manufacture. Four charcoal furnaces are in blast and output exceeds shipments by a small margin. Prices for Southern iron remain unchanged.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	$19.01 to 19.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	$28.79 to 29.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Wire Products.—Favorable weather conditions throughout most of the country have contributed to outdoor work in rural communities. The result is that jobbers are experiencing an active fall demand, which is fully equal to, if not above, what had been expected. In the Great Lakes region and in the Northwest the weather has remained open longer than usual, and this has been of benefit to the jobbing trade. The manufacturing trade, with the exception of automobile builders, continues to take satisfactory tonnages. The demand for nails is seasonally dull. Prices at Chicago are not above $2.45, base, per keg. Shipments of woven wire fencing are in good volume, the bulk of the tonnage going to jobbers, with only occasional lots being taken by the railroads. Production schedules for heavy electrical cables are well filled to the end of the year. Demand for wire rope is steady and has run ahead of the corresponding part of 1928.

Cold-Rolled Strip. — Specifications are measurably lighter, and output for the country as a whole has receded to 50 per cent of capacity. Backlogs, inquiries, new buying and specifications are at the low point of the year. Some estimates place the normal needs of cold-rolled strip by automobile manufacturers at 60 per cent of the output of the country. It is pointed out that no improvement in demand for this commodity can be expected until there is a swing upward in output of automobiles.

Rails and Track Supplies—About 563,000 tons of standard-section rails have been ordered by the Pennsylvania, New York Central and the Erie. Other orders are expected from the Rock Island, Illinois Central and Chicago & North Western. Though no official figures are available on the tonnages these railroads will take, the opinion is generally expressed here that they will exceed in size the orders placed for 1929 delivery. The Pennsylvania bought 310,000 tons, which is said to be the largest single order ever placed by a railroad. The distribution of the past week's orders is given elsewhere in this issue. New business in track fastenings is confined to tonnages for current track work. Releases against new rail orders have not been as heavy as sellers had expected, and the increase in the rate of rolling, which was to have gone into effect this week, has been postponed.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Cast Iron Pipe.—This market continues to mark time, with only occasional inquiries and lettings of more than 100 tons each. Sellers look for little improvement in conditions in the near future, though they see some light in the early part of next year if the bond market continues to strengthen. The Merkle Contracting Co., Kansas City, Mo., has been awarded the general contract to lay 44,000 ft. of 8-in., 2500 ft. of 6-in. and 6000 ft. of 4-in. pipe at O'Fallon, Ill. Royal Oak, Mich., has placed 1500 tons of cast iron pipe with the Lynchburg Foundry Co. This award was reported last week as having been taken by an unnamed bidder. The only inquiry of note in this district is by Streeterville, Ohio, which will buy 1000 ft. of 8-in., 17,000 ft. of 6-in., 6000 ft. of 4-in. and 3000 ft. of 2-in. cast pipe. Notwithstanding lagging interest on the part of buyers, prices are well stabilized at $35 to $38 a ton, Birmingham. Deliveries of all common sizes of cast iron pipe are prompt.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $43.70 to $45.70; 4-in., $47.70 to $49.70; Class A and gas pipe, $3 extra.

Reinforcing Bars.— Fabricating shops are shipping close to a normal volume of bars for this time of the year, but backlogs are light. Prices continue to show wide variation. Rail steel bars appear well established at

2c. a lb., but billet steel reinforcing bars show weakness and business has been taken at 2c., Chicago warehouse. Stocks in the hands of dealers are ample for current needs and promises of deliveries from mills are satisfactory. Sellers of reinforcing bars are closely watching progress of the plans for subway construction in Chicago. Preliminary estimates of reinforcing bars needed place the figure at 150,000 tons. As now indicated this work may get under way in 1930.

Wire Rods.—Specifications are coming in only in moderate volume. Prices have been definitely settled to $41 a ton, Chicago.

Plates.—New inquiries for oil storage tanks loom large as prospects brighten for an increase of petroleum production in the Oklahoma City, Okla., field. New business in sight totals 11,000 tons of plates. This, added to the inquiry that has been before the trade, brings the total prospective tonnage to more than 20,000 tons. New orders of tank plates total 2200 tons, of which 1000 tons is for shipment to an Oklahoma fabricator. The railroad equipment market remains active. Orders are close at hand for the 85,000 tons of steel needed for the Santa Fe cars. Although official plans are not announced, it is generally believed that shops will not rush through new orders, but rather will spread them out by holding to the present rate of output.

Old Material.—The Chicago scrap iron and steel market is dull in the heavy tonnage grades, but a substantial volume of quiet purchases is being made by steel foundries. Dealers are finding scrap harder to sell and they are also finding greater difficulty in meeting with the closer lines being drawn on specifications. Rejections are running unusually high, but the inflow of scrap is ample and there is little doubt that large melters are having their needs well filled. Railroad shipments are normal for this time of the year, while industrial scrap is probably in somewhat smaller volume than is usually expected in the early fall months. Dealers' yards in Chicago are not overburdened with stocks, but it is reported that country yards are piled high with scrap that is not moving. Prices, with few exceptions, are weak. Late last week heavy melting steel on sales that aggregated between 15,000 and 20,000 tons sold off 25c. a ton. Brokers offering cast iron borings to users at present quotations find no takers. Stocks of this grade are accumulating in the hands of producers and dealers and it is rather commonly believed that prices must be revised downward before they will be attractive to consumers. The Burlington will sell 3000 tons and special mid-month lists are being offered by the Pennsylvania and Nickel Plate.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.00c. to 2.30c.
Reinforc'g bars, rail steel	2.00c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands (¼ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, ⅜ in. and larger	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.95
Cement c't'd nails, base per keg	2.95

Prices deliv'd Chicago district consumers:

	Per Gross Ton
Basic Open-Hearth Grades:	
Heavy melting steel	$14.25 to $14.75
Shoveling steel	14.25 to 14.75
Frogs, switches and guards, cut apart, and misc. rails	15.75 to 16.25
Hydraul. compressed sheets	12.50 to 13.00
Drop forge flashings	10.75 to 11.25
No. 1 busheling	12.75 to 13.25
Forg'd cast and r'l'd steel carwheels	18.50 to 19.00
Railroad tires, charg. box size	18.50 to 19.00
Railroad leaf springs cut apart	18.50 to 19.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	17.00 to 17.50
Coil springs	19.00 to 19.50
Electric Furnace Grades:	
Axle turnings	14.25 to 14.75
Low phos. punchings	16.50 to 17.00
Low phos. plates, 12 in. and under	16.50 to 17.00
Blast Furnace Grades:	
Axle turnings	12.00 to 12.50
Cast iron borings	10.00 to 10.50
Short shoveling turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	16.00 to 16.50
Rerolling rails	16.75 to 17.25
Cupola Grades:	
Steel rails less than 3 ft.	17.50 to 18.50
Steel rails less than 2 ft.	19.50 to 20.00
Angle bars, steel	17.00 to 17.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades:	
Railroad	17.00 to 17.50
Agricultural	15.50 to 16.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00
	Per Net Ton
Rolling Mill Grades:	
Iron angle and splice bars	15.00 to 15.50
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	26.00 to 26.50
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.75 to 13.25
No. 1 busheling	9.00 to 9.50
No. 2 busheling	7.00 to 7.50
Locomotive tires, smooth	14.50 to 15.00
Pipes and flues	10.00 to 10.50
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	14.00 to 14.50
No. 1 agricultural cast	13.25 to 13.75
Stove plates	12.25 to 12.75
Grate bars	11.75 to 12.25
Brake shoes	10.75 to 11.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Bars.—Schedules at mild steel bar mills are more flexible, and deliveries may be had in 10 days to four weeks, depending on the sizes. Both sales and specifications, influenced largely by the needs of railroad car builders, are heavier than a week ago. Prices still show variation, with occasional concessions of $1 a ton. Demand for iron bars shows some improvement as the railroads take larger quantities. The rail steel bar market is featureless. New business balances shipments. Prices are steady.

Structural Material.—The outstanding award this week was 4500 tons for a railroad bridge in St. Louis. Other than this, awards were fairly plentiful, but of small individual size and spread over a wide area. Structural shop backlogs are growing lighter. Even large shops, which to date have been fairly well fortified with work, now are showing hunger for new tonnage. Prices of fabricated steel are weak and at a lower level than a year ago.

Mill prices on plain material, per lb.: 2.00c. to 2.05c. base, Chicago.

Wholesale Prices Fall Slightly

The index number of wholesale prices in September, as reported by the United States Bureau of Labor Statistics, was 97.5, compared with 97.7 in August and with 100.1 in September, 1928. All are based on 100 as the average of 1926. Of the major groups farm products and metals showed declines from August. Foods, hides and leather, fuel and lighting, building materials, chemicals and drugs and the miscellaneous items registered increases. Textile products and house furnishing goods showed no change.

While metals and metal products declined from 104.3 to 104.1, the iron and steel component remained stationary at 97.6, non-ferrous metals dropped from 105.1 to 104.9, agricultural implements from 98.3 to 98.2 and automobiles from 110.7 to 110.3. Other metal products showed no change.

Distribution of Week's Orders for Rails

THE Pennsylvania divided its order for 310,000 tons of standard-section rails as follows: Carnegie Steel Co. and Illinois Steel Co., jointly, 155,000 tons; Bethlehem Steel Corporation, 136,400 tons; Inland Steel Co., 18,600 tons.

New York Central orders totaling 206,430 tons were apportioned as follows: Bethlehem Steel Corporation, 87,040 tons; Illinois Steel Co., 76,200 tons; Carnegie Steel Co., 13,860 tons; Inland Steel Co., 16,930 tons; Dominion Iron & Steel Co. of Canada, 12,400 tons.

The Erie ordered 46,460 tons, of which Carnegie Steel Co. will furnish 24,387 tons; Illinois Steel Co., 11,112 tons; Bethlehem Steel Corporation, 7474 tons; Inland Steel Co., 3487 tons.

New York

Pig Iron Melt Well Sustained—Railroad Needs and Structural Work Feature Steel Orders

NEW YORK, Oct. 22.—Pig iron consumption in this district is holding up well. Virtually no suspensions of shipments are reported and in some cases melters are asking for deliveries of iron scheduled for shipment in November. Since little automotive work is done in this territory, the sustained melt is regarded as testimony to continued satisfactory condition of business outside of the motor car industry. The fact that there is little interest in first quarter requirements is merely a reflection of caution on the part of buyers. Purchases are confined mainly to spot needs and, at 8000 tons for the week, are of average proportions. The only large current inquiry is one for 3000 tons for the Thatcher Co., of which 1000 tons of No. 2X is for its Newark, N. J., plant and 2000 tons of No. 2 plain is for Garwood, N. J. While deliveries are to extend into the first quarter, they are to begin in November. Southern foundry iron is still offered at $13.50 to $14, base Birmingham, or $19 to $19.50, at docks in New York harbor. At this level Alabama iron is sharply competitive with Northern brands. Considerable barge iron is moving down the State canal from Buffalo, but it is doubtful whether the water movement this year will equal that of 1928. Current sales for barge movement must be made with an eye to the closing of navigation about the middle of next month.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$22.41 to $22.91
*Buf. No. 2, del'd east. N. J.	20.78 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	19.89 to 21.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	20.39 to 21.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Cast Iron Pipe.—Municipal buying of pressure pipe has declined with election approaching, and private purchasing is limited to small lots of pipe and fittings. Prices continue unsteady, with $32 to $33 a net ton, foundry, usually quoted by Northern makers, but $31 is occasionally bid when competition is keen. The Department of Water Supply, Gas and Electricity, New York, has opened bids on a number of small contracts for furnishing and laying water and gas pipe, but awards are still pending.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $34.60 to $36.60; 4-in. and 5-in., $37.60 to $39.60; 3-in., $44.60 to $46.60. Class A and gas pipe, $3 extra.

Finished Steel.—Railroad and structural steel orders are the features of steel buying in this market. The rail orders of the New York Central and Erie roads were placed last week, and details of distribution are given elsewhere in this issue. Car builders are optimistic that the car buying movement will continue during the remainder of the year, and prospective inquiries total upward of 25,000 cars. In structural steel, the principal award of the week was 17,500 tons for a hospital for the Cornell Medical Center in New York, which went to the Hedden Iron Construction Co. The Metropolitan Life Insurance Co. will build a 100-story building facing Madison Square Park which will require 30,000 to 40,000 tons of steel, but the inquiry has not yet been issued. In some lines of steel consumption, the demand has increased moderately in the past week, but the gains are too spotty to be indicative of a general upward trend in buying.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.24c. to 2.29c.; plates, 2.22½c.; structural shapes, 2.14½c.; bar iron, 2.14c.

Old Material.—Buying prices of brokers are off 50c. a ton to $15, delivered, on No. 1 heavy melting steel for the consumer at Bethlehem, Pa., but are unchanged at $15.50 a ton, delivered, to mills at Coatesville and Steelton, Pa. No. 2 heavy melting steel is being bought at $11.75 a ton, delivered Pottsville, Pa., $13 a ton, delivered Phoenixville, Pa., and $13.25 a ton, delivered Harrisburg, Pa. The quotation on steel mill stove plate is slightly softer, with brokers paying a maximum of $8 a ton, New York, or $11.50 a ton, delivered to a consumer at Phoenixville, Pa. Despite the low level of prices, a fair volume of all grades of scrap is reported available, although no surplus supplies are pressing on the market.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$12.00 to	$12.35
Heavy melting steel (yard)	8.00 to	9.50
No. 1 hvy. breakable cast.	10.25 to	11.00
Stove plate (steel works)		8.00
Locomotive grate bars		8.25
Machine shop turnings	7.50 to	8.00
Short shoveling turnings	7.50 to	8.00
Cast borings (blast furn. or steel works)	7.00 to	7.75
Mixed borings and turnings	6.75 to	7.75
Steel car axles	18.00 to	18.50
Iron car axles	23.00 to	24.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)		10.25
Forge fire	9.50 to	10.00
No. 1 railroad wrought	12.00 to	12.50
No. 1 yard wrought, long	11.00 to	11.50
Rails for rolling	12.75 to	13.25
Stove plate (foundry)	8.00 to	8.50
Malleable cast (railroad)	13.50 to	14.00
Cast borings (chemical)	9.50 to	10.00

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$16.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	14.00
No. 2 cast (radiators, cast boilers, etc.)	13.50

Warehouse Business.—Activity this month has not shown the improvement over September that is usual at this season. Demand for galvanized sheets is fair, but prices are still subject to concessions on both black and galvanized. There is a moderate volume of buying in structural steel, but bars, plates and blue annealed sheets are quiet.

Coke.—The market is unchanged, with furnace grade at $2.75 a net ton, Connellsville. Beehive foundry coke is

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.50c. to 3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut threads:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 6 in. and smaller	50 to 50 and 10

	Per 100 Ft.
Boiler Tubes—	
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-3 in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.75c. to 3.80c.
No. 22	3.90c. to 3.95c.
No. 24	3.95c. to 4.00c.
No. 26	4.05c. to 4.10c.
No. 28*	4.20c. to 4.25c.
No. 30	4.45c. to 4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.20c. to 4.40c.
No. 16	4.15c. to 4.25c.
No. 18	4.20c. to 4.40c.
No. 20	4.30c. to 4.50c.
No. 22	4.40c. to 4.60c.
No. 24	4.65c. to 4.75c.
No. 26	4.90c. to 5.00c.
No. 28*	5.15c. to 5.25c.
No. 30	5.55c. to 5.65c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

quoted at $4.85 a net ton, ovens, for special brands, or $8.56, delivered to northern New Jersey, Jersey City and Newark, and $9.44 to New York and Brooklyn. By-product foundry coke is quoted at $9 to $9.40 a net ton, Newark or Jersey City, and $10.06, New York or Brooklyn.

Cleveland

Improvement in Automotive Steel Buying Expected To Be Slow—Some Orders Placed for November-December

CLEVELAND, Oct. 22.—The volume of business continues light in all finished steel products. Reports from the automotive industry do not offer encouragement for much, if any, improvement for several weeks. Automobile manufacturers are still confronted with the problem of disposing of large stocks of present models of cars. Not only are dealers well stocked up but some manufacturers have rather large stocks that have not yet been passed along to the dealers. The disposal of used cars is still a problem, although in some sections stocks of used cars have been reduced considerably.

One automobile plant that recently resumed operations on a 1600 car per week schedule is shut down this week. Several motor car manufacturers are evidently delaying in getting under production on their new models until they can get present stocks largely disposed of. There is little expectation that the automotive industry will get under good operation again before January, and, if that is the case, the steel industry will not be stimulated much from this source before December. Operations of other industries in this territory are holding up fairly well.

Steel bar, sheet and strip mills in this territory are operating on considerably reduced schedules and have little tonnage on their books. There is little change in the price situation. Sheet prices appear well stabilized at the recent reductions, the only evidence of weakness being in metal furniture sheets.

Pig Iron.—The most encouraging feature of the market is an increase in shipments, which so far this month show quite a gain over those of the corresponding period of September. The increase is confined to fields other than the automotive industry. Shipments to automotive foundries continue light. Stove, radiator and furnace manufacturers are taking a fair amount of iron. Sales by Cleveland interests in the past week amounted to 18,600 tons in foundry and malleable iron, which was a gain over those of the previous week. The Westinghouse Electric & Mfg. Co. purchased approximately 1000 tons against its recent inquiry for iron for its Cleveland plant. The business went to Lake furnaces. Several other Cleveland foundries purchased smaller lots. There is practically no change in the price situation. Local furnaces are holding to $19, furnace, for Cleveland delivery. For outside shipment, $18.50 is the ruling price, and this is also being quoted by Valley furnaces. Lake furnaces that serve the Michigan territory appear to be holding to a $20 base for foundry grades for the eastern half of the State, but a $19.50 price is prevailing in central and western Michigan, where there is competition from the Chicago territory. Lower prices seem to have disappeared on Southern foundry iron, which is now quoted at $14 to $14.50, Birmingham.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$19.50
S'th'n fdy., 1.75 to 2.25	$20.50 to 21.00
Malleable	19.50
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	18.50
Stand. low phos., Valley	26.50 to 27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—Sheet bar specifications have been a little better the past week than during the early part of the month. Billets and slabs are dull. The Corrigan, McKinney Steel Co. has reduced operations, now running 11 of its 14 open-hearth furnaces. Incoming orders are against $35 contracts for sheet bars, billets and slabs.

Coke.—Demand for foundry coke is light and prices on better grades are unchanged. Connellsville heating coke is moving in limited volume at $2.75 to $3, ovens. There is a lull in the demand for blast furnace coke for domestic use, but producers have their October output sold. Ohio by-product foundry coke is quoted at $8.25, ovens.

Iron Ore.—The consumption of Lake ore during September amounted to 5,361,567 gross tons, a decrease of 417,570 tons from August. The amount consumed in September last year was 4,607,963 tons. Ore on hand at furnaces Oct. 1 amounted to 32,360,108 tons and the amount at furnaces and Lake Erie docks on that date was 38,125,312 tons, as compared with 35,808,367 tons on Oct. 1 of last year. Central district furnaces consumed 2,745,624 tons of ore in September, a decrease of 167,320 tons for the month. Lake front furnaces used 2,378,053 tons, a decrease of 202,021 tons. Eastern furnaces melted 124,098 tons, a decrease of 1123 tons, and all-rail furnaces used 113,792 tons, a loss of 47,106 tons. There were 186 furnaces using Lake ore in blast Sept. 30, a decrease of six for the month.

Strip Steel.—While some hot-rolled strip was purchased by the automotive industry during the week, the orders were not large enough to have much effect on mill schedules, which have been sharply reduced. Some of the mills are operating at not over 50 per cent of capacity and have virtually no backlogs. Cold-rolled strip appears to be moving even slower than the hot-holled material. Prices on hot-rolled strip appear to be holding fairly steady, for the small lots that are moving, at 1.90c., Pittsburgh, for wide material and 2c. for narrow. On cold-rolled strip 2.75c., Cleveland, is the ruling quotation.

Bars, Plates and Shapes.—Demand for steel bars, which declined sharply with the curtailment of the automotive industry, shows no improvement. Structural shapes and plates also are rather quiet. Orders for all three products are confined to small lots. Forge shops catering to the automotive industry do not have much business. Reinforcing bars are very dull. In the structural field, 3500 tons was placed for an Akron bank and office building. New inquiry is light. Small fabricating shops are well filled with work, but some of the larger shops need orders. Steel bars are quoted at 1.90c., Cleveland, by local mills. While outside mills quote a range of 1.90c. to 1.95c., Cleveland, the lower price has become more general. Weakness recently reported on plates seems to have disappeared, and plates and shapes are commonly quoted at 1.95c., Pittsburgh.

Sheets.—Orders from the automotive industry are rather spotty and business in the aggregate is light. Additional releases of good-sized lots of auto body sheets for the new Chevrolet cars were issued during the week for November and December shipment. An inquiry for 1300 tons of various grades for electric refrigerators is pending from a Cleveland stamping plant. Steel barrel manufacturers are operating better than a few weeks ago and this has brought orders for black sheets. Weakness has developed in metal furniture sheets, on which 4.10c. is now the common price, with reports of a 4c. price. Blue annealed sheets and light plates rolled on jobbing mills appear to be holding to regular quotations, but on continuous mill products going to the automotive industry in fair to large-sized lots the market seems definitely established at 2.15c. for No. 13 gage and 2c. for No. 10 light plates. Galvanized sheets

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex	3.65c.
Cold-fin. flats and sq	4.15c.
Hoops and bands, No. 12 to $\frac{1}{16}$ in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.70c. to 3.90c.
Galvanized sheets (No. 24)	4.60c. to 4.75c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb	$2.65
No. 9 gal. wire, per 100 lb	3.00
Com. wire nails, base per keg	2.65

*Net base, including boxing and cutting to length.

are steady at 3.50c. and efforts to get a higher price seem to have disappeared.

Wire Products.—Wire is moving slowly and nails are very dull. The nail market continues weak. Ruling prices are $2.40 per keg to jobbers and $2.50 to dealers. Wire is fairly steady at 2.40c., Cleveland.

Warehouse Business.—The improvement that usually appears in jobbers' business in October has failed to materialize this month. While warehouses are getting a good number of orders, they are for smaller lots than usual. Demand for galvanized sheets is tapering. Prices are well maintained.

Old Material.—The market continues dull, activity being largely limited to purchases of heavy melting steel and blast furnace scrap by dealers to cover outstanding orders. With the exception of a 50c. a ton reduction on No. 2 busheling, prices are unchanged and the market does not show a tendency toward either higher or lower quotations. Dealers are able to buy all the scrap they need within the range of the quoted prices. Mills have good stocks, and it is not expected that there will be much new consumer demand during the next few weeks.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$14.75 to $15.00
No. 2 heavy melting steel	14.25 to 14.50
Compressed sheet steel	14.75 to 15.25
Light bundled sheet stampings	12.00 to 12.50
Drop forge flashings	13.00 to 13.25
Machine shop turnings	10.00 to 10.50
Short shoveling turnings	11.50 to 12.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	16.00 to 16.50
No. 1 busheling	13.25 to 13.75
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades:	
Low phos., forging crops	17.75 to 18.00
Low phos., billet, bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50
Blast Furnace Grades:	
Cast iron borings	10.50 to 11.00
Mixed borings and short turnings	10.50 to 11.00
No. 2 busheling	10.00 to 10.50
Cupola Grades:	
No. 1 cast	17.50 to 18.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	18.50 to 19.50
Miscellaneous	
Railroad malleable	18.00 to 18.50
Rails for rolling	16.25 to 16.50

Philadelphia

Plate and Shape Demand Active—Pennsylvania Expected To Take Full Rail Options This Year

PHILADELPHIA, Oct. 22.—Steel orders continue in fair volume, but small in individual tonnage, especially in bars and sheets. Plate mills in eastern Pennsylvania are maintaining varying rates of operation, certain mills having curtailed, while others are still fairly well engaged. Shape mills are booking some good business, with construction work at a high level despite the advanced season. A substantial part of the present business is coming from the railroads. Plates and shapes for six car floats for the Reading Railroad have been placed by shipbuilders and the Pennsylvania Railroad has placed 1000 cars to be built by the Bethlehem Steel Co. at Johnstown, Pa.

Allocation of the Pennsylvania Railroad's 1930 rail requirements brought 88,000 tons, with 48,400 tons more on option, to the Bethlehem Steel Co., 100,000 tons, with 55,000 tons more on option, to the Carnegie Steel Co., and 12,000 tons, with 6600 tons on option, to the Inland Steel Co. Although this railroad on its 1929 rail tonnage took only slightly more than one-third of its 70 per cent option, the fact that this year's option is for 55 per cent of the award and that considerable electrification work is in progress leads mills to believe that the entire optional tonnage may be taken.

Pig Iron.—Current buying of foundry iron is confined almost entirely to carload lots or less than 100 tons. The market is somewhat less firm, with certain eastern Pennsylvania sellers seeking more tonnage, but concessions of more than 50c. a ton from $21, base, furnace, have not generally appeared, as present buying is not sufficiently large to bring out the minimum price. Consumers are increasingly inclined to delay purchases while they seek concessions from the current market. About 1000 tons of foundry iron for a local foundry has been pending award since August and the buyer has, meanwhile, been buying carload lots for immediate needs at $21 a ton, base. No inquiries have been made for basic iron, but two leading buyers are expected in the market soon.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$21.26 to $21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.26
East. Pa. No. IX	22.26 to 22.76
Basic (del'd east. Pa.)	19.75 to 20.25
Gray forge	20.00 to 20.50
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. br'g low phos. (f.o.b. furnace)	23.50 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	24.04
Va. No. 2X, 2.25 to 2.75 sil.	24.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—Buying is limited to small lots and 1.90c., Pittsburgh, or 2.22c., delivered Philadelphia, is the usual price on new business, although 1.95c., Pittsburgh, or 2.27c., delivered Philadelphia, is still quoted on the less desirable specifications.

Reinforcing Bars.—Projects requiring steel are increasing and a substantial tonnage of bars is being placed, but prices show no tendency to advance. Billet steel bars are quoted at 1.95c. to 2.05c., Pittsburgh, or 2.27c. to 2.37c., delivered Philadelphia, usually without the extra charge for cutting to length. Rail steel bars range from 1.85c. to 1.95c., Franklin, Pa., or Tonawanda, N. Y., or 2.17c. to 2.27c., delivered Philadelphia. New bids being taken on the Farm Show Building, Harrisburg, Pa., call for 245 tons of reinforcing bars. A bulkhead on the Schuylkill River in Philadelphia will require 500 tons of bars.

Shapes.—Certain of the smaller fabricators are seeking tonnage and quoting keenly competitive prices, but most shops are well engaged with contracts and bidding on a larger tonnage of new business than is usual at this season. Prices, however, show no tendency to advance from 1.90c. to 2c., f.o.b. nearest mill to consumer, or 1.96c. to 2.06c., delivered Philadelphia. The Pennsylvania Railroad has awarded the steel contract for a suburban passenger station at West Philadelphia to the McClintic-Marshall Co. The project calls for 16,000 tons of steel. Steel for the Farm Show Building, Harrisburg, Pa., on which former bids were rejected as they exceeded the appropriation, has been reduced on the new inquiry from 4000 to 1700 tons.

Plates.—Shipyards and railroads are contributing some good tonnages of plates. A total of 3000 tons has been placed for six car floats for the Reading Railroad, two to be built by the Newport News Shipbuilding & Dry Dock Co. and four by the New York Shipbuilding Corporation. The United States Lines is expected to call for bids about Nov. 15 on two large passenger ships. The Pennsylvania Railroad has placed 1000 cars with the Bethlehem Steel Co. Plate

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.60c.
Cold-fin. steel, sq. and flats	4.10c.
Steel hoops	3.55c.
Steel bands, No. 12 to ⅛-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.10c.
†Galvanized sheets (No. 24)	4.85c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'l'd sheets (No. 13)	3.40c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

prices are unchanged at 2.05c., Coatesville, Pa., or 2.15c., delivered Philadelphia.

Sheets.—The market is quiet and demand is light, with both automobile body and radio manufacturers on curtailed operations in most cases. Black sheets range from 2.75c. to 2.85c., Pittsburgh, or 3.07c. to 3.17c., delivered Philadelphia, and galvanized sheets are at 3.50c., Pittsburgh, or 3.82c., delivered Philadelphia. Blue annealed sheets are unchanged at 2.35c., Pittsburgh, or 2.67c., delivered Philadelphia, for No. 13 gage and blue annealed light plates, No. 10 gage, are quoted at 2.20c., Pittsburgh, or 2.52c., delivered Philadelphia. These prices on blue annealed sheets and light plates are shaded $2 a ton when competition is encountered from the product of the continuous mill, or preferred buyers are in the market.

Imports.—In the week ended Oct. 19, a total of 204 tons of pig iron arrived at this port from Norway, 31 tons of ferromanganese from the United Kingdom and 28 tons of ferrochrome from Switzerland. Steel imports consisted of 37 tons of steel scrap from the United Kingdom, 25 tons of steel bars from France and 19 tons from Belgium, 46 tons of steel hoops from Germany, 101 tons of structural shapes from France and 100 tons from Germany.

Old Material.—Buying of scrap by consumers is small and prices show a continued tendency to decline. Heavy breakable cast, however, seems to have reached a temporary low point at $14.50 a ton, delivered, as efforts of consumers to buy at $14 and $14.25 a ton, delivered, have not met with much success. No. 1 and No. 2 heavy melting steel is coming out in good volume at the present level of prices.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$15.50 to $16.00
Scrap T rails	15.00 to 15.50
No. 2 heavy melting steel	12.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	11.50
Hydraulic compressed, new	14.50 to 15.00
Hydraulic compressed, old	12.00 to 12.50
Machine shop turnings (for steel works)	12.00
Heavy axle turnings (or equiv.)	14.00 to 14.50
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	14.50 to 14.75
Railroad grate bars	12.00 to 12.50
Stove plate (for steel works)	12.00
No. 1 low phos., hvy., 0.04% and under	22.00 to 23.00
Couplers and knuckles	19.50 to 20.50
Rolled steel wheels	19.50 to 20.50
No. 1 blast f'nace scrap	10.50 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.)	14.50
Shafting	19.00 to 19.50
Steel axles	22.75 to 23.25
No. 1 forge fire	14.00
Cast iron carwheels	16.50
No. 1 cast	16.00 to 16.50
Cast borings (for chem. plant)	14.50
Steel rails for rolling	16.50 to 17.00

Railroad Equipment

Orders for 25,000 to 30,000 More Cars Expected This Year

ALTHOUGH railroad equipment buying in the week was featured by only one sizable order, that of the Pennsylvania Railroad for 1000 steel box cars, the outlook for railroad equipment purchases over the remainder of the year continues promising.

Fully 25,000 to 30,000 cars may be purchased in the next two months. For most of these the formal inquiries have not appeared, but they are expected soon.

Details of the week's business follow:

Of about 2700 cars to be inquired for by the Burlington, inquiries have reached the market for 500 automobile cars and 100 flat cars.

Pennsylvania Railroad has ordered 1000 steel box cars from Bethlehem Steel Corporation.

An inquiry from the Chesapeake & Ohio for 5000 or 6000 cars is expected soon.

Bessemer & Lake Erie is reported to be preparing plans for 3000 cars.

An official statement of Pere Marquette says that a rehabilitation program will involve purchase of rolling stock to replace about 25 per cent of that now owned. This would mean purchase of about 4500 freight cars and more than 100 locomotives.

Missouri Pacific's expected inquiry may be for about 4000 cars.

Wabash may inquire for 2000 cars.

New York, New Haven & Hartford and Chicago & North Western are expected purchasers of several thousand cars each. Chicago & North Western is now inquiring for 100 underframes for caboose cars.

North American Car Corporation is inquiring for 1500 steel underframe refrigerator cars.

Cerro de Pasco Copper Corporation has ordered 20 50-ton cars from American Car & Foundry Co.

Imperial Refining Co., Ltd., is inquiring for 215 tank cars.

Reinforcing Steel

Pending Work Totals 7680 Tons —Awards 4600 Tons

INCLUDING 1000 tons for a bridge on the Pacific Coast, reinforcing steel awards in the week totaled nearly 4600 tons. Pending work amounts to about 7680 tons, of which 1100 tons is for an assembly plant for the Ford Motor Co. at Edgewater, N. J., 1000 tons for a rubber manufacturing building at Passaic, N. J., and 1000 tons for a warehouse in San Francisco. Awards follow:

PHILADELPHIA, 375 tons, medical building for Temple University, to Taylor-Davis, Inc.

PHILADELPHIA, 325 tons, Henry Avenue bridge, to Taylor-Davis, Inc.

CHICAGO, 125 tons, building for Kroger Grocery Co., to Concrete Engineering Co.; previously reported to an unnamed bidder.

CHICAGO, 500 tons, warehouse for Goodyear Tire & Rubber Co., to Calumet Steel Co.

CHICAGO, 150 tons, Fine Arts Building, to Joseph T. Ryerson & Son, Inc.

CHICAGO, 250 tons, bridge, to Concrete Engineering Co.

PEORIA, ILL., 350 tons, bridge, to Concrete Engineering Co.

MILWAUKEE, 100 tons, structure for Milwaukee Railroad, to American System of Reinforcing.

TACOMA, WASH., 290 tons, cold storage plant, to unnamed bidder.

EVERETT, WASH., 500 tons, pulp plant for Puget Sound Pulp & Timber Co., to Pacific Coast Steel Co.

PORTLAND, ORE., 1000 tons, St. John's River bridge, to Pacific Coast Steel Co.

PORTLAND, 200 tons, plant for Paper Makers Corporation, to Mercer Steel Co.

SACRAMENTO, CAL., 100 tons, club house, to unnamed bidder.

SAN FRANCISCO, 135 tons, school at Turk and Ashbury Streets, to Truscon Steel Co.

LOS ANGELES, 320 tons, warehouse at Bay and Mateo Streets, to Blue Diamond Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

EDGEWATER, N. J., 1100 tons, assembly plant for Ford Motor Co.

PASSAIC, N. J., 1000 tons, United States Rubber Co. plant, general contract to Turner Construction Co.; 100 tons for foundation was awarded to Concrete Steel Co., as reported last week.

HARRISBURG, 245 tons, Farm Show Building; bids open Oct. 23.

PHILADELPHIA, 700 tons, Henry Avenue bridge over Wissahickon Creek; previously reported as 150 tons.

CITY OF PHILADELPHIA AND PENNSYLVANIA RAILROAD, 550 tons, bulkhead on west bank of Schuylkill River; Frederick Snare Corporation, general contractor.

PHILADELPHIA, 100 tons, viaduct, Thirtieth and Arch Streets; Vincent Jafolla, general contractor.

AURORA, ILL., 175 tons, building for Illinois Bell Telephone Co.

CHICAGO, 500 tons, warehouse for Goodyear Tire & Rubber Co.

CHICAGO, 500 tons, garage.

STURGEON BAY, WIS., 110 tons, State highway bridge; bids Nov. 6.

TACOMA, WASH., 800 tons, Eleventh Street viaduct; bids Oct. 21.

PORT ANGELES, WASH., 500 tons, pulp mill; bids being taken.

SAN FRANCISCO, 550 tons, Pier No. 1; general contract placed.

SAN FRANCISCO, 1000 tons, warehouse for Pacific Gas & Electric Co.; bids opened.

Machine Tool Builders Meet

The practical value of establishing an apprenticeship training program and a further improvement in trade practices were stressed by Henry Buker, vice-president, Brown & Sharpe Mfg. Co., Providence, R. I., in his address as president of the National Machine Tool Builders' Association at its twenty-eighth annual convention, which opened its general sessions at Briarcliff Manor, N. Y., Tuesday afternoon.

The association unanimously voted to expand its program of activities during the coming year and elected the following directors for a three-year term: C. R. Burt, vice-president and general manager, Pratt & Whitney Mfg. Co., Hartford, Conn.; George E. Randles, president, Foote-Burt Co., Cleveland, and Robert M. Gaylord, vice-president, Ingersoll Milling Machine Co., Rockford, Ill.

Pacific Coast

Reinforcing Steel Awards Total Upward of 2500 Tons—Demand for Structural Steel Well Sustained

SAN FRANCISCO, Oct. 19 (*By Air Mail*).—Reinforcing steel bar trade was the most active feature of the steel market this week, more than 2500 tons having been placed. Included among the more important contracts were 1200 tons of structural shapes for a viaduct in Denver, 1000 tons of bars for a bridge at Portland and 450 tons of rails for Long Beach, Cal. Prices continue on a fairly even keel, and little shading has been indulged in.

Pig Iron.—Foundry operations have shown little signs of improvement and increased pig iron buying is not looked for until after the first of the year. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Mild steel bars are not in active demand, though prices appear to be firm at 2.35c., c.i.f. coast ports. Most of the orders received by mills call for small lots of numerous sizes. Awards of reinforcing steel bars this week were the heaviest of any week since the latter part of June. The Pacific Coast Steel Co. took 1000 tons for the approaches to the St. John's River bridge, Portland, and 500 tons for a pulp plant at Everett, Wash. The Mercer Steel Co. secured 200 tons for a factory in Portland and the Truscon Steel Co. booked 135 tons for a school in San Francisco. Included among pending projects are 1000 tons for a warehouse in San Francisco and 800 tons for the Eleventh Street viaduct in Tacoma. Prices on this class of material continue at 2.30c., base, on carload lots and 2.60c. on smaller tonnages in the San Francisco district, Los Angeles prices being $2 a ton higher.

Plates.—Plate business this week was limited to lots of less than 100 tons, and new inquiries of importance were lacking. The largest pending project calls for 1400 tons for a 36 to 48-in. welded steel pipe line at Everett, Wash., bids on which will be opened Oct. 24. Prices are not firm at 2.35c., c.i.f.

Shapes.—Demand for structural steel is well sustained. Awards this week included, in addition to 1200 tons for the Twenty-third Street viaduct, Denver, mentioned above and placed with the American Bridge Co., 500 tons for a telephone building in Vancouver, B. C., placed with the Western Bridge Co., and 100 tons for a school in San Francisco, booked by Dyer Brothers. Bids were opened this week on 1337 tons for a bridge over the San Luis Rey River in southern California. The Port Stockton Cement Co., Stockton, Cal., is taking bids on 1000 tons for a cement plant. Plain material remains firm at 2.35c., c.i.f.

Track Material.—The United States Steel Products Co. secured 300 tons of 128-lb. girder rails and 150 tons of 90-lb. T-rails at $34,181 for Long Beach. Bethlehem Steel Co. was the only other bidder at $35,025.

Cast Iron Pipe.—Only three awards in excess of 100 tons were noted in the cast iron pipe market this week. The American Cast Iron Pipe Co. took 110 tons of 10-in. Class 150 pipe for Eureka, Cal. Burbank, Cal., placed 109 tons of 4-in. Class B pipe with C. G. Claussen & Co. and has opened bids on 261 tons of 6 and 8-in. Class B pipe. An unnamed interest secured 185 tons of 4 to 12-in. Class B pipe for Broadway, Santa Monica, Cal. The National Cast Iron Pipe Co. was low bidder on 297 tons of 10-in. Class B pipe for El Segundo, Cal. Vernon, Cal., and Los Angeles have opened bids on 800 tons and 215 tons respectively.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.30c.
Struct. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100 lb. keg	3.40

Birmingham

Open-Hearth Operations Increased at Alabama Plants—Rail Buying Helps Out at Ensley

BIRMINGHAM, Oct. 22.—As this is an in-between buying period for pig iron, new business is light. It is too early for local consumers to show interest in first quarter iron and inquiries coming in from other territories are in the nature of feelers and have not brought in business for the first quarter. Specifications on contracts for November requirements are frequent, and pressure for immediate shipment is still a factor in the market. Shipments continue to exceed the make, and there is a possibility that October will be the outstanding month of the year in tonnage moved. The base price for the district remains firm at $14.50. Prices to outside points continue to be adjusted to meet competition, concessions varying from 50c. to $1 a ton. Furnace operations are unchanged. Seven are on foundry iron, seven on basic and one on recarburizing iron, a total of 15.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$14.50
No. 1 fdy., 2.25 to 2.75 sil.	15.00
Basic	14.50

Finished Steel.—Some improvement is noticed in new business, with the beginning of the fall buying period for certain lines. Recent steel rail and railroad accessory buying has added considerably to the backlog of the Tennessee company. Demand for bars, plates and structural shapes continues at the brisk rate that has been characteristic of the market for some time. Wire products are overcoming some of the slump that began in late summer. New business of structural steel fabricators was better last week than for either of the two preceding weeks. The Nashville Bridge Co. received orders of 450 tons for the Allen Mfg. Co. plant at Franklin, Tenn., and 75 tons for a bascule section of the Pensacola Bay bridge. New orders of the Virginia Bridge & Iron Co. include 220 tons for a garage at Birmingham. The Nichols Copper Co., El Paso, Tex., has ordered 185 tons more from the Ingalls Iron Works Co. New tonnages for reinforcing bars are also developing at a better rate, but demand is still considered below normal. The Tennessee company is operating eight of nine open-hearths at Ensley, an increase of three. Seven of eight are active at Fairfield, and the Gulf States Steel Co. continues to work all six at Alabama City.

Cast Iron Pipe.—Backlogs are being rapidly depleted, and reduced operations will occur unless there is an improvement in buying within the next two weeks. All current projects are small. These include 6000 ft. of 6-in. pipe for Greenville, Ala., to be let Nov. 1; one mile of 12-in. and two miles of 8-in. for Murfreesboro, Tenn., to be let Nov. 1, and 1200 ft. of 6-in. for Marks, Miss., to be let Nov. 5. The United States Pipe & Foundry Co. will ship 44,000 ft. of 20-in., 18,000 ft. of 18-in. and 2000 ft. of 16-in. pipe to Griffin, Ga. Stocks on yards are low and all the current make is being shipped. Prices remain at $37 to $38 a net ton, Birmingham.

Old Material.—A gradual development in demand over the past few weeks has placed steel scrap in a fairly good position. Both dealers' and consumers' stocks are low. Iron material continues inactive, and dealers have large stocks. Prices are unchanged.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$13.00 to $13.50
Scrap steel rails	14.00
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	11.50 to 12.00
Steel axles	21.00
Iron axles	23.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	15.50
No. 1 cast	13.00
Tramcar wheels	12.50
Cast iron carwheels	13.00 to 13.50
Cast iron borings, chem.	13.50 to 14.00

Youngstown

Valley Steel Output at 70 Per Cent—No Further Reduction May Be Necessary

YOUNGSTOWN, Oct. 22.—Valley steel makers seem to have reached the low point in operating schedules occasioned by the reduced demands of automobile makers, and began the present week with slight'y increased operating rates in some departments. However, the rate of steel ingot production remains essentially unchanged, with approximately two-thirds of the open-hearth furnaces in the district melting and production at not more than 70 per cent of theoretical capacity. It is believed that no further reduction in steel output will be necessary to bring production in line with demand, but the extent of the expected recovery next month is a matter of some conjecture on the part of steel company executives.

Valley steel mills have realized more than ever before in the last two months the full extent of their dependence upon the automobile industry, and the amount of total tonnage produced in the district which goes to the automotive makers or related users is estimated at as high as 35 per cent. No other steel center, with the possible exception of Cleveland, ships more material to that industry.

Increased specifications for November shipment are reported by nearly all companies. But it is not yet known just how large will be the requirements of the two largest makers of low-priced cars. However, it seems assured that both the Ford and Chevrolet companies will be in production on their changed models by Dec. 1 and that their steel tonnage will be gradually stepped during the last month of the year. The future course of other companies is not so well defined, but it is believed in many quarters that other car makers will pursue a very cautious course over the remainder of the year and cannot be counted upon to take steel at anything approaching a maximum rate.

Tin plate production in the district does not average more than 60 per cent of capacity, but a low rate is expected at this time of the year and during November operations can be counted upon to improve gradually as next year's tonnage reaches company order books. Nail and wire mills are also running slowly, and pipe production, at least in butt-weld departments, is tapering off seasonably. Lap-weld and seamless mills are fairly active, but backlogs are light, and oil-country demand is not impressive. Bar mills are running at about 75 per cent of capacity, and demand is described by most makers as somewhat better. Strip operations are very low, but this department is probably profiting more than any others by improving specifications for future delivery. The leading maker of high-finished sheets is running at close to 80 per cent, but this is above the average for sheet mills as a whole.

The price structure, following reductions of an average of $2 a ton on most of the leading products, is much stronger than it was at the opening of the month. A notably favorable influence is the apparent strength of primary materials quotations. As finished steel prices weakened, pig iron and semi-finished steel quotations held, and at higher levels than were in effect in the first and second quarters. Non-integrated steel makers ordinarily exert considerable pressure for lower crude steel prices under such circumstances, but a large per cent of semi-finished steel requirements is now furnished either by a related company or under a long time contract and buyers have found that any open market decline in the price of billets, slabs and sheet bars is nearly always nullified by lower finished steel prices. Nearly all the buyers of semi-finished steel have covered their requirements for the fourth quarter at unchanged prices, and the market is very quiet. The pig iron market is also very quiet, but the price is not seriously questioned by larger users.

Youngstown steel companies are frankly pleased by an opinion made public last week by the Interstate Commerce Commission declaring that the proposed rate of $1.02 on coal from river terminals at Conway and Colona, Pa., into Youngstown is too high. This is the first victory of Valley interests in their effort to secure the advantage of rail-and-barge rates from southeastern Pennsylvania mines to the Valleys.

Canada

Pig Iron Shipments By Water Are Heavy

TORONTO, ONT., Oct. 22.—Although the reduction in Canadian pig iron prices brought no general improvement in the demand, new business continues to appear in steady volume, with the weekly average well sustained. Only a small amount of forward tonnage was booked during the week, but spot sales were fairly heavy. The demand for immediate delivery is holding at a good level and melters are entering the market regularly for lots up to 500 tons. Hand-to-mouth buyers are responsible for the bulk of new business. Shipments on new order account and against contracts are said to be at the high point for the year. Much of the improvement in shipments is due to the fact that water deliveries are being speeded up and endeavors are being made to get as much iron as possible over this route before the close of navigation. Pig iron prices are unchanged for the week and local blast furnace representatives do not look for further reductions in the immediate future.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$23.60
No. 2 fdy., sil. 1.75 to 2.25	23.10
Malleable	23.60

Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$25.00
No. 2 fdy., sil. 1.75 to 2.25	24.50
Malleable	25.00
Basic	23.50

Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Structural Steel.—Some improvement in sales was noted during the week. Individual tonnages were mostly under the 1000-ton average, but new orders were more numerous than for three or four weeks past. Inquiries are good and some large tonnages are still in prospect for closing before the end of the year. Shipments to new works are in large tonnage and fabricators are running at capacity on back orders.

Old Material.—Except for a slight improvement in demand, the old material market is without change. Mills are taking in good supplies of heavy melting steel and turnings against contracts and are placing small-tonnage orders for immediate delivery. The iron grades are holding at a high level, with foundries and other consumers showing keen interest in the market.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$10.00	$8.50
Rails, scrap	11.00	9.00
No. 1 wrought	10.00	12.00
Machine shop turnings	7.50	5.00
Boiler plate	7.50	6.00
Heavy axle turnings	8.00	7.50
Cast borings	7.50	5.00
Steel borings	7.50	6.50
Wrought pipe	6.00	6.00
Steel axles	15.00	20.00
Axles, wrought iron	17.00	22.00
No. 1 machinery cast	....	17.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
	Per Net Ton	
No. 1 mach'ry cast	$16.00	....
Stove plate	12.00	....
Standard carwheels	15.00	....
Malleable scrap	14.00	....

Michigan Steel Castings Plant Expands

Rebuilding its main foundry and replacing its 1½-ton furnace with a 3-ton Moore furnace is the program of the Monroe Steel Castings Co., Monroe, Mich. The main foundry, when completed, will be 50 ft. x 225 ft. Oil-fired core ovens are to be installed, consisting of a double compartment rack oven, each compartment to be 5 ft. 6 in. wide and 8 ft. deep to accommodate racks of cores 4 ft. wide, 7 ft. long and 6 ft. high. There are to be two drawer ovens, each 3 ft. x 5 ft., furnished by the Crawford Oven Co., New Haven, Conn. The electric furnace is to be equipped with a 2500-kva. transformer, furnished by the Pennsylvania Transformer Co. A new sand-blast room was recently installed and a 5-ton crane has been purchased.

Boston

Pig Iron Sales Decline—Scrap Prices Hold Firm but There Is Little Business

BOSTON, Oct. 22.—There was a falling off in pig iron sales the past week, with transactions totaling scarcely 2500 tons. The Mystic Iron Works took about 1000 tons, from 800 to 1000 tons went to Buffalo furnaces, and the remainder was in scattered orders, some of which went to Alabama furnaces. Practically all of the sales were in small tonnages for delivery during this quarter and they afforded no real test of prices. The Mystic furnace is holding at $20 to $20.75, furnace, and Buffalo producers are quoting $18, Buffalo. A Rhode Island foundry is inquiring for 1000 tons of malleable for December and first quarter.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25	$21.78 to $22.28
†Buffalo, sil. 2.25 to 2.75	22.28 to 22.78
*Buffalo, sil. 1.75 to 2.25	22.41 to 22.91
*Buffalo, sil. 2.25 to 2.75	22.91 to 23.41
East. Penn., sil. 1.75 to 2.25	22.65 to 23.15
East. Penn., sil. 2.25 to 2.75	23.15 to 23.65
Va., sil. 1.75 to 2.25	25.21
Va., sil. 2.25 to 2.75	25.71
*Ala., sil. 1.75 to 2.25	24.11
*Ala., sil. 2.25 to 2.75	24.61
†Ala., sil. 1.75 to 2.25	20.25
†Ala., sil. 2.25 to 2.75	20.75

Freight rates: $4.91 all rail from Buffalo, and $4.28 rail and water; $3.65 all rail from eastern Pennsylvania; $5.21 all rail from Virginia; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

Reinforcing Bars.—A State bridge at Jewett City, Conn., calls for 270 tons of reinforcing bars, contract for which has been awarded to the Concrete Steel Co. Other small awards totaled about 300 tons.

Structural Steel.—The city of Boston has awarded two jobs to the New England Structural Co. One was 250 tons for a fire station and the other was 150 tons for a health unit. Structural fabricators are taking a fair volume of work in small tonnages.

Old Material.—One of the quietest weeks of the year has been experienced by the scrap trade. Sellers show little interest in the market and are offering very little scrap, which counterbalances with the position of buyers, who are demanding very little scrap. For the first time in months there was no change in scrap prices, which in itself tells the story of market stalemate. The Italian steamship Amaranto is loading about 1500 tons of scrap at this port for Egypt.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.50 to $10.75
Scrap T rails	10.50 to 10.75
Scrap girder rails	9.50 to 10.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	9.00 to 9.50
Machine shop turnings	6.50 to 7.00
Cast iron borings (steel works and rolling mill)	6.00 to 6.50
Bundled skeleton, long	9.00 to 9.50
Forge flashings	9.50 to 10.00
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	8.50 to 9.00
Shafting	13.50 to 14.00
Steel car axles	17.50 to 18.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.25 to 9.50
Rails for rolling	12.00 to 12.50
Cast iron borings, chemical	9.50 to 9.75
Prices per gross ton deliv'd consumers' yards:	
Textile cast	$14.00 to $14.50
No. 1 machinery cast	15.00 to 15.25
No. 2 machinery cast	13.00 to 13.25
Stove plate	11.00 to 11.50
Railroad malleable	18.50 to 19.00

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flat, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Squares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

St. Louis

Pig Iron Market Extremely Dull—Improvement in Steel Buying—Scrap is Weaker

ST. LOUIS, Oct. 22.—With sales of only 800 tons of pig iron, the last week was perhaps the lightest period the St. Louis Gas & Coke Corporation has had since it began production. Sales of Southern makers were correspondingly small. The dullness now marking the pig iron trade is the aftermath of the exceedingly heavy buying movement of more than a month ago. Most melters now are well covered for the remainder of the year. The Granite City maker's sales included 500 tons to a local jobbing foundry, 250 tons to an Iowa melter and 100 tons to a Belleville, Ill., foundry. The melt is holding up well except in foundries catering to the automobile trade. Shipments are not up to last month's movement, but are above the average.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$19.50 to $20.00
Malleable, f.o.b. Granite City	20.00
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	16.92 to 18.92
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—The movement of domestic grades of coke continues very good, and producers of by-product fuel are reducing their piles. Foundry and furnace grades are also in good demand.

Finished Iron and Steel.—An improvement in buying of plates, shapes and bars and sheets is reported. However, the demand is for materials as they are needed, with little future buying. Bids have been asked for the construction of Wenzlick Tower, an office building which has been under discussion for some time; it will require 3800 tons of structural steel and 450 tons of reinforcing bars. Business continues dull with fabricators.

Old Material.—The market for old material continues weak. Consumers are buying very little, and prices they are offering to pay are reported to be less than dealers are willing to accept. Heavy offerings by railroads centering here were absorbed by dealers, most buying being to fill contracts. Because of low prices very little is coming in from the country dealers. Miscellaneous standard-section rails, rails for rolling, No. 1 railroad cast and stove plate are 25c. off, while heavy turnings, cast iron car wheels and railroad malleable are 50c. less, and railroad springs declined 75c. Railroad lists: Chicago, Burlington & Quincy, 4860 tons; Wabash, 360 tons; New Orleans Great Northern, 150 tons, and Pullman Co., St. Louis, four carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	$13.50 to $14.00
No. 2 heavy melting or shoveling steel	13.00 to 13.50
No. 1 locomotive tires	15.50 to 16.00
Miscel. stand.-sec. rails including frogs, switches and guards, cut apart	15.25 to 15.75
Railroad springs	17.00 to 17.50
Bundled sheets	10.00 to 10.50
No. 2 railroad wrought	13.50 to 14.00
No. 1 busheling	10.00 to 10.50
Cast iron borings and shoveling turnings	9.50 to 10.00
Iron rails	13.00 to 13.50
Rails for rolling	15.75 to 16.25
Machine shop turnings	7.50 to 8.00
Heavy turnings	9.50 to 10.00
Steel car axles	19.50 to 20.00
Iron car axles	27.50 to 28.00
Wrot. iron bars and trans.	21.50 to 22.00
No. 1 railroad wrought	13.75 to 14.25
Steel rails, less than 3 ft.	18.00 to 18.50
Steel angle bars	15.25 to 15.75
Cast iron carwheels	14.50 to 15.00
No. 1 machinery cast	15.25 to 15.75
Railroad malleable	15.50 to 16.00
No. 1 railroad cast	14.50 to 15.00
Stove plate	12.25 to 12.50
Agricult. malleable	15.25 to 15.75
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Cincinnati

Easing in Automotive Foundry Demand Affects Pig Iron and Coke—Scrap Market Dull and Weak

CINCINNATI, Oct. 22.—The district pig iron market is quiet and featureless. Sales of iron last week totaled about 3600 tons, an increase of only 50 tons over those of the preceding week. The easing off in the automotive demand is causing district consumers to become cautious and, consequently, buying is confined almost entirely to immediate requirements, with an occasional purchase in anticipation of needs for 30 to 45 days. The largest tonnage placed last week was from the Wickham Piano Plate Co., Springfield, Ohio, which took 300 tons of Northern foundry iron for fourth quarter use. The remainder of the week's tonnage was made up of carload and 100-ton lots. It is apparent that the heavy buying of Southern iron has been checked for the time being. All Southern furnaces doing business in this district are maintaining quotations at about $14 to $14.50, base Birmingham, and no concessions are reported. Quietness of the market in general is reflected by the absence of any sizable inquiry.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89 to $20.39
Ala. fdy., sil. 1.75 to 2.25	17.69 to 18.19
Ala. fdy., sil. 2.25 to 2.75	18.19 to 18.69
Tenn. fdy., sil. 1.75 to 2.25	17.69 to 18.19
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—New orders for sheets last week were a trifle less than during the preceding week. Backlogs have been reduced substantially, and the delivery situation is improving, 10 days to three weeks being the usual promise on blue annealed and black sheets and three to five weeks on special sheets. Uncertainty of prices is affecting the wire and wire nail market.

Coke.—As a result of the reduction of specifications for by-product foundry coke from automobile foundries, the shipment of coke on contracts last week was noticeably less than in the preceding week. In fact, oven representatives say that, if specifications continue at the present rate, October shipments will total less than those of September. New business is confined to spot shipments of a car or two at a time.

Old Material.—The old material market is soft and dull. Dealers report that the supply of good scrap is none too plentiful. While the mills are accepting shipments on old contracts at a fair rate, new business is small. Accordingly, dealers have broadened the spread on heavy melting steel, No. 2 wrought, cast iron borings and machine shop turnings to 50c. by cutting the bottom prices 25c.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$13.00 to $13.50
Scrap rails for melting	14.25 to 14.75
Loose sheet clippings	8.75 to 9.25
Bundled sheets	11.00 to 11.50
Cast iron borings	8.75 to 9.25
Machine shop turnings	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.00 to 7.50
Rails for rolling	14.50 to 15.00
No. 1 locomotive tires	14.25 to 14.75
No. 2 railroad wrought	13.00 to 13.50
Short rails	18.50 to 19.00
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	19.00 to 19.50
No. 1 railroad cast	15.25 to 15.75
Burnt cast	10.25 to 10.75
Stove plate	10.25 to 10.75
Brake shoes	10.25 to 10.75
Agricultural malleable	14.25 to 14.75
Railroad malleable	15.25 to 15.75

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex. Squares	3.85c. 4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg	2.85
Cement c't'd nails, base 100 lb. keg	2.85
Chain, per 100 lb	8.75
	Net per 100 Ft.
Lap-weld steel boiler tubes, 2-in.	$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shaftings, screw stock	3.75c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	5.10c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	5.15c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb	50

Buffalo

Mill Operations Range from 65 to 70 Per Cent

BUFFALO, Oct. 22.—The Ford Motor Co is understood to have placed about 3000 tons of basic with a district furnace. The price is reported to have been about $17.25 to $17.50 on boats, Buffalo. The basic placed is understood to have been of a special grade, analyzing 1.50 per cent silicon. The Ford purchases of pig iron recently are said to total 23,000 tons. An inquiry is out for 1000 tons of malleable from New England and two foundry inquiries from the East run 1500 tons each. The General Electric Co. has bought 1500 tons of foundry and malleable.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$19.50
No. 2X fdy., sil. 2.25 to 2.75	20.00
No. 1 fdy., sil. 2.75 to 3.25	21.00
Malleable, sil. up to 2.25	20.00
Basic	$17.50 to 18.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Mill operations in this district have dropped further, running now about 65 to 70 per cent, and probably will not gain until the automobile plants resume fuller schedules. A school at Amherst, Mass., calls for 575 tons of shapes instead of 300 tons as previously reported.

Old Material.—Mills apparently have adequate supplies of scrap for present operations and are not now interested in further buying. There has been a nominal weakening of prices in most of the grades. One of the larger mills has issued instructions to dealers to slow down their shipments.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$15.50 to $16.50
No. 2 heavy melting steel	14.00 to 14.50
Scrap rails	16.00 to 16.50
Hydraul. comp. sheets	14.00 to 14.50
Hand bundled sheets	11.00 to 11.50
Drop forge flashings	14.25 to 14.50
No. 1 busheling	14.00 to 14.50
Hvy. steel axle turnings	14.00 to 14.50
Machine shop turnings	7.50 to 8.00
No. 1 railroad wrought	13.00 to 13.50
Acid Open-Hearth Grades:	
Knuckles and couplers	17.50 to 18.00
Coil and leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phos. billet and bloom ends	18.00 to 18.50
Electric Furnace Grades:	
Short shov. steel turnings	11.50 to 12.00
Blast Furnace Grades:	
Short mixed borings and turnings	11.50 to 12.00
Cast iron borings	11.50 to 12.00
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades:	
Steel car axles	18.75 to 19.25
Iron axles	21.00 to 22.00
Cupola Grades:	
No. 1 machinery cast	15.00 to 15.50
Stove plate	12.50 to 12.75
Locomotive grate bars	11.50 to 12.00
Steel rails, 3 ft. and under	19.50 to 19.75
Cast iron carwheels	13.50
Malleable Grades:	
Industrial	17.50 to 18.50
Railroad	17.50 to 18.50
Agricultural	17.50 to 18.50
Special Grades:	
Chemical borings	12.50 to 13.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats, sq. and hex.	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb	3.75

Detroit

October Auto Output to Show Further Decline

DETROIT, Oct. 22.—Industries in this area not directly supplying the automotive plants have not yet been influenced to any great extent by the slowing down of automotive production. Operations in these industries continue at a rate above average.

There have been no important developments in the automotive field during the past week. October output will fall below that of last month and probably below the total for October, 1928. If the total for the current month reaches 400,000 units, it probably will be as much as can be expected.

According to a statement of L. A. Miller, president, Willys-Overland Co., his organization will limit 1930 production to approximately 300,000 units. It is also stated that the Reo Motor Car Co. will adopt a similar policy.

The Murray Corporation of America will reach capacity operation about December, with a daily average of about 1500 bodies. Its new plant containing 750,000 sq. ft. of floor space will be completed by Nov. 1.

Old Material. — The tone of the market on old material is decidedly weak, with most sales on the low side of the price range. Further curtailment of automobile production has reduced the pig iron melt to the lowest point of the year.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$13.75 to $14.25
Borings and short turnings	8.25 to 8.75
Long turnings	8.00 to 8.50
No. 1 machinery cast	12.50 to 13.00
Automobile cast	13.00 to 13.50
Hydraul. comp. sheets	13.75 to 14.25
Stove plate	9.00 to 9.50
New No. 1 busheling	11.75 to 12.25
Old No. 1 busheling	10.25 to 10.75
Sheet clippings	8.00 to 8.50
Flashings	12.25 to 12.75

City in Iowa Objects to New Rail Rates

WASHINGTON, Oct. 22.—Exceptions to the proposed report of Examiners William J. Koebel and Peter C. Paulson in connection with the investigation of the steel rate structure in Western Trunk Line territory have been filed with the Interstate Commerce Commission by the Marshalltown (Iowa) Chamber of Commerce and Marshalltown shippers. It was urged that the commission should not approve the recommendations, which, it was said, would result in higher rates.

If the report be approved in part or in modified form, the petition said, such action should not be taken until after additional hearings are held. Contention was made that the Western Trunk line carriers are not as a whole entitled to increased class rates. Establishment of higher rates, the petition said, would be prejudicial to interior Iowa points as a whole and especially to central Iowa points and unduly preferential to Mississippi River, Illinois and Official territory competitors of the Iowa shippers.

Tri-cities Ask for Lower Freight Rates on Steel

WASHINGTON, Oct. 22. — Treating bars, plates and shapes as raw materials which their manufacturers use in producing agricultural products and other lines, the Chambers of Commerce of Davenport, Iowa, and Rock Island, Ill., and the Association of Commerce and Deere & Co., Moline, Ill., have petitioned the Interstate Commerce Commission to reopen the Official Classification territory steel rate case and place these products on a lower scale and raise the minimum carload requirement from 40,000 to 80,000-lb. The petition of the Tri-Cities expressed the view that the scale prescribed is excessive and will produce an increased cost of transportation in Illinois territory alone in excess $2,500,000 annually. The increased revenue on the business of the petitioners is estimated at $250,000.

The petition declared that within approximately two years water transportation will be available from the Chicago Steel district, their chief source of supply, to the Tri-Cities and that the cost of transportation of steel by water will be much less than the present rate of 17c. a 100-lb., minimum 36,000-lb., and less than one-half of the proposed rate of 19.5c. per 100-lb., minimum 40,000-lb. The annual movement to the Tri-Cities, it was stated, is about 500,000 tons.

Foundry Equipment Orders Decline Slightly

The September index of gross orders for foundry equipment, as reported by members of the Foundry Equipment Manufacturers Association, was 216.3, compared with 229.5 in August and 170 in the same month a year ago. The index of shipments, at 176.8, showed a gain from the 150.8 of August. Unfilled orders also increased, standing at 480.8, the highest index since September, 1928.

Otis Steel Co. Earnings $1,093,376 in Quarter

Net profits of the Otis Steel Co. for the third quarter of 1929 were $1,093,376, after all charges including estimated Federal taxes of $149,096. This compared with $950,786 reported for the third quarter of 1928, after all charges including taxes of $129,653. Earnings for the period were equal to $1.05 a share on the 841,002 shares of common stock outstanding, against 92c. a share reported on 806,002 shares one year ago.

For the first nine months of 1929, as reported by E. J. Kulas, president, the company earned $3,891,774, after all charges and Federal taxes of $530,696, equal to $3.89 a share on the 841,002 shares of common stock outstanding. In the corresponding period of 1928, the company earned $2,693,852, after all charges and Federal taxes of $367,343, equal to $2.57 a share on the 806,002 shares of common stock.

During September earnings, after all charges, were $321,667, compared with $307,481 in September, 1928.

Youngstown's Earnings Increase in Quarter

The Youngstown Sheet & Tube Co.'s net profits in the third quarter were $6,756,741, a gain of almost $650,000 over the $6,107,057 reported for the June quarter. Gross income was $10,705,026, from which $2,129,213 is deducted for depreciation, $918,403 for miscellaneous charges and $900,668 for interest on funded debt.

Total net profit for nine months is $17,294,114. After dividend requirements on 5½ per cent preferred stock, this is equal to $16.67 per share on 1,000,000 shares of common stock outstanding.

Sharon Steel Hoop Co. to Issue 90,000 New Shares

The Sharon Steel Hoop Co., Sharon, Pa., has authorized the issuance of 90,000 shares of the no par common stock of the company to be offered to stockholders of record on Oct. 28 at $40 a share, and is asking waivers from stockholders on 15,000 shares of this authorized issue. The proceeds of this sale are to be used by the company to reduce its funded debt and for other corporate purposes. Only stockholders owning 25 or more shares will be requested to waive or assign their pro rata subscription rights to the 15,000 shares desired by the company, which are to be held for the purpose of sale to employees and for such other purposes as the directors decide.

Organization Plan for Steel Foundries

A complete plan of organization and program of activities for the future conduct of the Steel Founders' Society of America has been recommended to the executive committee of the society after an exhaustive survey of the steel foundry industry. This recommendation has been favorably received by the executive committee and will be presented to the full membership of the society and to the industry at large at a meeting at the Sherman Hotel in Chicago, Tuesday, Oct. 29. The managing director of the society, Granville P. Rogers, in a statement, urges all steel foundries in the country to be represented at this meeting, which "may mark a turning point in the affairs of the society and the industry."

Non-Ferrous Metal Markets

Lowest Tin Price Since 1923 — Zinc Declines — Copper and Lead Quiet and Steady

NEW YORK, Oct. 22.

Copper.—Consumers of copper continue to buy sparingly and the price is unchanged. Sellers are of the opinion that the present quotation will remain in force for some time to come. Despite moderate activity at present, sales of copper for domestic delivery in October have thus far been the largest since the record month of March when about 110,000 gross tons was sold. Most of this buying took place in September. Domestic consumers are well covered for October, but still have some metal to buy for November delivery. Only a little December metal has been purchased. Foreign consumers are buying fair quantities each day, but still have metal to buy for both October and November delivery, particularly November. Weakness in the London market, which has affected tin and zinc particularly, has had no influence on copper. Electrolytic copper for delivery in the Connecticut Valley is quoted at 18c., with Lake copper at 18c. to 18.12½c., delivered. The quotation of Copper Exporters, Inc., is still at 18.30c., c.i.f. usual European ports.

Tin.—Spot Straits tin has continued to decline each day during the past week from the low point of a week ago until yesterday when it was 40.25c., New York. This was the lowest price since Aug. 21, 1923, when it was 39.37½c. Today, because of a slight recovery in London, spot Straits tin, New York, was higher at 41.37½c., New York, about 500 tons changing hands, with dealers the principal buyers. Sales for the week ended Saturday, Oct. 19, were about 700 tons, with sales for yesterday and today amounting to about 700 tons more. Despite the declining market, buyers continued hesitant and did not buy much on the way down. Yesterday the market was very weak, but today buying by two London houses, one evidently covering short sales, has strengthened the situation. A feature has been the free selling in the Far East, where good quantities have been disposed of each day. A revision in the estimate of Straits shipments in October places the total at about 9000 tons instead of 10,000 tons. London prices today were about £1 per ton higher than yesterday, with spot standard quoted at £182, future standard at £186 and spot Straits at £186 10s. The Singapore price today

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	Oct. 22	Oct. 21	Oct. 19	Oct. 18	Oct. 17	Oct. 16
Lake copper, New York	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	41.37½	40.25	40.87½	41.00	41.50	42.12½
Zinc, East St. Louis	6.70	6.75	6.80	6.80	6.80	6.80
Zinc, New York	7.05	7.10	7.15	7.15	7.15	7.15
Lead, St. Louis	6.70	6.70	6.70	6.70	6.70	6.70
Lead, New York	6.90	6.90	6.90	6.90	6.90	6.90

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Rolled Products

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—
- High brass ..... 23.25c.
- Copper, hot rolled ..... 26.75c.
- Zinc ..... 10.25c.
- Lead (full sheets) .. 11.00c. to 11.25c.

Seamless Tubes—
- High brass ..... 28.25c.
- Copper ..... 29.25c.

Rods—
- High brass ..... 21.25c.
- Naval brass ..... 24.00c.

Wire—
- Copper ..... 19.87½c.
- High brass ..... 23.75c.

Copper in Rolls ..... 26.75c.
Brazed Brass Tubing ..... 30.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

- Sheets, 0 to 10 gage, 3 to 30 in. wide ..... 33.00c.
- Tubes, base ..... 42.00c.
- Machine rods ..... 34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	23.25c.
Copper, hot rolled	27.75c.
Copper, cold rolled, 14 oz. and heavier	30.00c.
Zinc	10.75c.
Lead, wide	11.35c.
Seamless Tubes—	
Brass	28.25c.
Copper	29.25c.
Brass Rods	21.25c.
Brazed Brass Tubes	31.00c.

New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

Sheets—	
High brass	21.12½c. to 22.12½c.
Copper, hot rolled, base sizes	27.75c. to 28.75c.
Copper, cold rolled, 14 oz. and heavier, base sizes	30.00c. to 31.00c.
Seamless Tubes—	
Brass	26.00c. to 27.00c.
Copper	29.12½c. to 30.12½c.
Brazed Brass Tubes	29.12½c. to 30.12½c.
Brass Rods	18.87½c. to 19.87½c.

New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.75c. to 11.25c.
Zinc sheets, open	11.50c. to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	43.00c. to 44.00c.
Tin, bar	45.00c. to 46.00c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	19.00c.
Zinc, slab	7.75c. to 8.25c.
Lead, American pig	7.62½c. to 8.12½c.
Lead, bar	9.62½c. to 10.12½c.
Antimony, Asiatic	10.50c. to 11.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½	29.00c. to 30.00c.

Metals from Cleveland Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	46.50c.
Tin, bar	48.50c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	18.75c.
Zinc, slab	8.00c. to 8.25c.
Lead, American pig	7.55c. to 7.75c.
Lead, bar	9.75c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade	18.75c.
Babbitt metal, high grade	50.50c.
Solder, ½ and ½	29.50c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	15.00c.	16.50c.
Copper, hvy. and wire	14.50c.	16.00c.
Copper, light and bottoms	12.75c.	13.75c.
Brass, heavy	8.25c.	9.25c.
Brass, light	7.00c.	8.00c.
Hvy. machine composition	12.00c.	13.00c.
No. 1 yel. brass turnings	9.75c.	10.50c.
No. 1 red brass or compos. turnings	11.25c.	12.25c.
Lead, heavy	5.50c.	6.00c.
Lead, tea	4.25c.	5.25c.
Zinc	3.50c.	4.00c.
Sheet aluminum	13.75c.	16.00c.
Cast aluminum	12.00c.	14.00c.

was £186 10s., with 475 tons reported sold, which does not add strength to the market. Stocks in London warehouses are lower at 10,412 tons because of shipments to New York.

Lead.—Although the London market was decidedly lower yesterday, with a slight recovery today, prices here are unchanged at 6.70c., St. Louis. Demand has been quiet for some time and is even lighter now. The leading interest continues to quote 6.90c., New York, as its contract price.

Zinc.—Because of marked weakness in the London market, with prices at a level which would permit imports of prime Western zinc at prevailing levels, producers here have generally lowered their quotations to 6.70c., East St. Louis, or 7.05c., New York. Thus far, this has not stimulated buying, which continues moderate. It is stated that orders from consumers are at the lowest point since the organization of the American Zinc Institute. With stocks so low, it is argued that larger buying must appear before long. This depends largely on the conviction of consumers that the bottom of the market has been reached. Because of a deadlock between producers and buyers of ore, purchases were down to 7720 tons last week, increasing stocks materially. Production was 13,000 tons for the week. The ore price is unchanged at $44, Joplin.

Antimony.—There is a good demand from consumers for October and early November delivery, due to the Chinese revolutionary disturbances. The market is accordingly stronger for Chinese metal at 8.75c., New York, duty paid, for all positions.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. per lb., with shot nickel at 36c. and electrolytic nickel in cathodes at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at the published price of 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Oct. 22.—The local nonferrous metal market is quiet. Prices for tin are off 2c. a lb. and quotations are lower on zinc. Prices for antimony have reacted upward. The old metal market is without feature.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 41.25c.; lead, 6.80c.; zinc, 6.80c.; in less-than-carload lots, antimony, 9.62½c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3.25c.; pewter, No. 1, 24.50c.; tin foil, 26c; block tin, 36c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

L. A. Benson & Co., Baltimore, have been appointed distributers in the Baltimore district for the products of the Diamond Chain & Mfg. Co., Indianapolis.

Non-Ferrous Ingot Prices in October

CHICAGO, Oct. 21.—Non-ferrous Ingot Metal Institute reports below the average prices per pound received by its membership on commercial grades of the six principal mixtures of ingot brass during the 28-day period ended Oct. 11. As there are, as yet, no generally accepted specifications for ingot brass, it must be understood that each item listed below represents metal known to the trade by a common designation but, in reality, including many variations in formulas. Until the program of standardizing the principal specifications, now progressing in cooperation with the American Society for Testing Materials, is completed, the following specifications will be understood to refer to "commercial grades."

	Cents per Lb.
Commercial 80-10-10 (1 per cent impurities)	17.31
Commercial 78 per cent metal	15.25
Commercial 81 per cent metal	15.574
Commercial 83 per cent metal	15.827
Commercial 85-5-5-5	16.086
Commercial No. 1 yellow brass ingot	12.861

The combined deliveries of brass and bronze ingots and billets by the members of the Non-Ferrous Ingot Metal Institute for September amounted to 7944 tons, according to announcement made by the institute today.

New Copper Refining Plant in Canada

A new $5,000,000 custom copper refining plant is being erected by the Ontario Refining Co. on a 40-acre site near Sudbury, Ont. It is anticipated that the plant will be in operation by January, 1931.

Three main buildings will be erected. The electrolytic cell house will be 300 x 400 ft. and will have 1200 reinforced concrete cells with lead linings. The casting buildings will be 200 x 400 ft. and will have three furnaces, each with a capacity of 450,000 lb. of copper. Both buildings will be of brick over steel construction. Associated in the Ontario Refining Co. are the International Nickel Co. of Canada, the American Metal Co., Consolidated Mining & Smelting Co. of Canada, and Ventures, Ltd.

Textiles and Coal Are More Active, Say Statisticians

Both production and distribution have been continuing well above last year's level, according to the October report of the Conference of Statisticians in Industry, operating under the auspices of the National Industrial Conference Board, New York.

Slight recessions in the iron and steel and automobile industries have been balanced in part by an increase in operations in several divisions of the textile group and in coal mining, due partly to seasonal influences. Bituminous coal production has been larger, since Aug. 1 than for the same period in any recent year except 1926.

Newspaper advertising continues to run well above last year's appropriations, indicative of optimism among dealers as regards available fall business.

While in several of the heavier industries stocks on hand are more than normal, indicating a slackening of demand in those particular commodities, this is ascribed to conservatism on part of buyers and as having obviated all danger of commodity price inflation.

September Sheet Output and Shipments Declined

The decreased demand for sheets due to the slowing down of the automotive industry is again reflected in the monthly report of the National Association of Flat Rolled Steel Manufacturers, which shows that there was less activity by independent mills during September in sales, production and shipments than in any pervious month this year. There was a rather sharp falling off in production and shipments as compared with August, but not much decrease in the tonnage booked. Sales were 274,568 tons, compared with 282,107 tons in the previous month. Production was 302,490 tons, against 366,734 tons in August while shipments declined from 365,649 tons in August to 301,330 tons last month. Unfilled orders also declined, having been 522,803 tons on Oct. 1, compared with 570,613 tons on Sept. 1. The September report and comparisons in net tons follow:

	September	August	July
Total number of mills	715	722	723
Capacity per month	459,075	492,765	486,430
Percentage reporting	67.4	67.9	67.9
Sales	274,568	282,107	337,222
Production	302,490	366,734	323,905
Shipments	301,330	365,649	344,676
Unfilled orders	522,803	570,613	658,155
Unsh'pped orders	111,042	108,887	107,751
Unsold stocks	43,886	34,436	47,103
Percentages of Capacity			
Sales	88.7	84.4	102.2
Production	97.7	109.7	98.1
Shipments	97.4	109.4	104.4
Unfilled orders	168.9	170.7	199.4
Unshipped orders	35.9	32.6	32.6
Unsold stocks	14.2	10.3	14.3

River Movement of Iron and Steel Is Heavy

September movement of iron and steel products on the Ohio River amounted to 150,163 tons, another high record for this traffic, compared with 137,734 tons in August and 125,062 tons in September, 1928. On the Monongahela River, 135,773 tons of iron and steel was moved in September, compared with 134,426 tons in the preceding month and 136,227 tons in September, 1928.

Four 78-in. vortex collectors are to be provided for the Aliquippa plant of the Jones & Laughlin Steel Corporation by H. A. Brassert & Co., Chicago. They will be built by the American Blower Corporation. Capacity is 90,000 cu. ft. a minute each of blast furnace gas at 350 deg. Fahr.

Fabricated Structural Steel

Awards of 58,000 Tons Include 17,500 Tons for New York Hospital and 16,000 Tons for Philadelphia Station

FABRICATED structural steel lettings in the week, as reported to THE IRON AGE, totaled slightly more than 58,000 tons, compared with 23,000 tons in the preceding week. The amount added to pending work was nearly 38,000 tons.

The largest award was 17,500 tons for a hospital for the Cornell Medical Center, New York, taking 17,500 tons. A Chicago tower building accounts for 15,000 tons of the new work in the market. The Metropolitan Life Insurance Co. will soon ask for bids on a 100-story building in New York that will take 30,000 to 40,000 tons of steel.

Awards follow:

NEW HAVEN, CONN., 1300 tons, Sterling Law School and dormitories at Yale University, to Levering & Garrigues Co.

NEW YORK, 17,500 tons, New York Hospital for Cornell Medical Center, to Hedden Iron Construction Co.

NEW YORK, 1100 tons, apartment building at Seventh Avenue and Sixteenth Street, to Hedden Iron Construction Co.

NEW YORK, 1250 tons, 19-story apartment building on East Seventy-second Street, to Paterson Bridge Co.

NEW YORK, 1100 tons, American Museum of Natural History, to Easton Structural Steel Co.

STATE OF PENNSYLVANIA, 125 tons, highway bridge in Bedford County, to McClintic-Marshall Co.

MEDIA, PA., 700 tons, Delaware County Court House, to Lehigh Structural Steel Co.

PENNSYLVANIA RAILROAD, 16,000 tons, suburban terminal at West Philadelphia, to McClintic-Marshall Co.

YORK, PA., 350 tons, high school building, to Bauman Iron Works, Reading.

STATE COLLEGE, PA., 400 tons, building, to Anthracite Bridge Co., Scranton.

ARDMORE, PA., 300 tons, store for Strawbridge & Clothier, to Shoemaker Bridge Co.

MINEOLA, N. Y., 180 tons, Junior beams, Roosevelt Field hangars, to Jones & Laughlin Steel Corporation.

MORRISTOWN, N. J., 118 tons, Junior beams, Our Lady of Grace School, to Jones & Laughlin Steel Corporation.

BALTIMORE, 1200 tons, highway bridge, to Bethlehem Steel Co.

BIRMINGHAM, 220 tons, Woods-Chevrolet garage, to Virginia Bridge & Iron Co.

FRANKLIN, TENN., 450 tons, Allen Mfg. Co. plant, to Nashville Bridge Co.

EL PASO, TEX., 185 tons, Nichols Copper Co. power house, to Ingalls Iron Works.

STATE OF TEXAS, 500 tons, bridge for Wharton Bridge Co., to Virginia Bridge & Iron Co.

BRAZIL, SOUTH AMERICA, 400 tons, steel flume for a Brazilian electric company, to Virginia Bridge & Iron Co.

FLINT, MICH., 1500 tons, office building, to Flint Structural Steel Co.

LANSING, MICH., 965 tons, factory for Fisher Body Co., to Whitehead & Kales Co.

HAMILTON, ONT., 100 tons, Junior beams, Hamilton General Hospital, to Jones & Laughlin Steel Corporation.

PORTSMOUTH, OHIO, 112 tons, Junior beams, George D. Schudder School, to Jones & Laughlin Steel Corporation.

PORTSMOUTH, 100 tons, Junior beams, Harding Elementary School, to Jones & Laughlin Steel Corporation.

AKRON, OHIO, 3500 tons, bank and office building for Central Savings & Trust Co., to Berger Iron Works.

CHICAGO, 1200 tons, Ruth garage, to an unnamed bidder.

ST. LOUIS, 4500 tons, bridge for Missouri Pacific across Merrimac River, to an unnamed bidder.

EAST ST. LOUIS, ILL., 280 tons, buildings at Curtiss-Steinberg Air Field, to McClintic-Marshall Co.

SAN FRANCISCO, 100 tons, school, Turk and Ashbury Streets, to Dyer Brothers.

BURNABY, B. C., 500 tons, addition to plant of Dominion Bridge Co., owner to do fabricating.

VANCOUVER, B. C., 500 tons, telephone office building, to Western Bridge Co.

SEATTLE, 100 tons, sack house for Fisher Flouring Mills Co., to Isaacson Iron Works.

DENVER, 1200 tons, Twenty-third Street viaduct, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

HARRISBURG, PA., 1700 tons, Farm Show Building; bids opened Oct. 23, original bids rejected as exceeding appropriation.

BOSTON, 2200 tons, Atlantic National Bank.

EDGEWATER, N. J., 800 tons, viaduct over Erie Railroad tracks for Ford Motor Co.'s new assembly plant.

PROVIDENCE, R. I., 1000 tons, Crawford Street bridge.

NEW YORK, 1000 tons, New York Trade School on East Sixty-sixth Street.

NEW YORK, 2400 tons, apartment building at Park Avenue and Seventy-third Street.

STATE OF NEW JERSEY, 600 tons, bridge over Passaic River.

WILMINGTON, DEL., 250 tons sheet steel piling, deep water power station for United Engineers & Constructors, Inc.

PHILADELPHIA, 5000 tons, municipal convention hall.

PHILADELPHIA, 500 tons, building for Stanley Co.

LEBANON, PA., 300 tons, building for Lebanon Steel Foundry Co.

NEWPORT NEWS, VA., 500 tons, building for Horace E. Dodge Boat & Plane Corporation.

LANSING, MICH., 1800 tons, R. E. Olds Co. bank and office building; Hunter Construction Co., Fon du Lac, Wis., general contractor.

SPRINGFIELD, ILL., 1500 tons, State buildings; J. B. French & Co., general contractors; Mississippi Valley Structural Steel Co., low bidder on steel.

CHICAGO, 1000 tons, apartment building.

NORTHERN PACIFIC, 800 tons, bridge work.

CHICAGO, 500 tons, 124th Field Artillery Armory; Mississippi Valley Structural Steel Co., low bidder.

CHICAGO, 15,000 tons, addition to building and tower of National Bank of the Republic.

OMAHA, NEB., 2000 tons, Union Pacific station; this is in addition to previous tonnage.

UNION PACIFIC RAILROAD, 300 tons, viaduct.

STURGEON BAY, WIS., 1340 tons, State highway bridge; bids Nov. 6.

KENOSHA, WIS., 300 tons, factory for Snap-On Wrench Co.

SACRAMENTO, CAL., 1337 tons, bridge over San Luis Rey River; bids opened.

SALINAS, CAL., 109 tons, two bridges for Monterey County; bids Oct. 21.

STOCKTON, CAL., 1000 tons, plant for Port Stockton Cement Co.; bids being taken.

International Standards Association Formed

WASHINGTON, Oct. 19.—The national standards bodies of 20 countries have made notable endeavor in recent years to establish a permanent international standards organization, according to M. H. Bletz, chief, Foreign Standards Section, Department of Commerce. As a result of this activity, organizations of 16 European countries now have agreed to establish the International Standards Association and have elected a president and secretary.

Early activities of the association, Mr. Bletz said, will be directed toward definite cooperation among the separate national bodies, standardization of methods and procedure, comparison of experience and results of investigations, and the coordination of activities when possible.

"International scientific organizations have given the world most of the existing international standards," said Mr. Bletz. "These are standards of time, length, weight, color and temperature, as well as basic standards for chemical, mechanical, physical and electrical elements. While the exigencies of international commerce required these standards, science or science in industry has actually been a few steps ahead of the demand.

"On the other hand, competition for world industrial supremacy, or, at least, the desire for leading positions in world commercial or industrial accomplishments, appears to act as a drawback to greater international uniformity in specifications for commodities. Apparently, until there is a greater equality in the producing methods in the different countries, industrial rivalry between nations will continue to delay a larger development of international commodity standards."

Interstate Stockholders Approve Sale

Stockholders of the Interstate Iron & Steel Co., Chicago, have formally approved the acquisition of the company by the Central Alloy Steel Corporation. The plan calls for the exchange of one and eleven fortieths shares of Central Alloy stock for each share of Interstate Iron & Steel common, of which there are 250,000 shares outstanding.

PERSONAL

JAMES P. ALLEN, president and general manager, Union Steel Casting Co., Pittsburgh, has resigned, effective immediately, and has been succeeded by JAN R. DUNSFORD, vice-president of the Lewis Foundry & Machine Co., Groveton, Pa., another subsidiary of

J. P. ALLEN

Q. S. SNYDER

the Blaw-Knox Co., Blawnox, Pa. Mr. Allen went with the Union company more than 27 years ago as sales manager and had been president and general manager since 1918. He began his business career with the American Steel Foundries, first at the Thurlow plant, Chester, Pa., and later as superintendent of the company's Alliance, Ohio, plant. He then went with the Union company. Mr. Allen has no definite plans for the future, but expects to spend the next six months in travel and rest. Mr. Dunsford became identified with the Lewis company two years ago, after having served as sales manager of the Wheeling Mold & Foundry Co., Wheeling, W. Va., where he was associated with Frank Cordes, now president of the Lewis company. When this company was acquired by the Blaw-Knox Co. a few weeks ago, Mr. Dunsford was made a director in the parent company. W. C. EICHENLAUB, secretary and sales manager of the Union Steel Casting Co., has also resigned and is now identified with the Pittsburgh Steel Foundry Corporation, Glassport, Pa., as sales manager. He became associated with the Union company 25 years ago and has served in his recent capacity for 12 years. C. H. LEHMAN has been elected secretary of the Union company to succeed Mr. Eichenlaub. GEORGE DAUMBAULD, assistant treasurer of the Blaw-Knox Co., has been made a director of that company.

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Q. S. SNYDER has been elected president of the Pittsburgh Rolls Corporation, Pittsburgh, subsidiary of the Blaw-Knox Co., Blawnox, Pa., and has also been made a director in the parent company. He succeeds the late David L. Eynon as president of the Rolls corporation. Mr. Snyder went with the company 10 years ago as vice-president and became general manager three years ago.

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A. D. BROWN, who has acted as special factory representative for the Pittsburgh transformer division of Allis-Chalmers Mfg. Co., Milwaukee, for the past year, has been appointed district manager of the Buffalo office of the company, succeeding M. W. PHELPS, who has resigned.

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THOMAS I. S. BOAK, formerly superintendent of one of the plants of Goulds Pumps, Inc., Seneca Falls, N. Y., has been made works manager for all of the plants.

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ROBERT L. WHEARLEY has been appointed manager of the Chicago office of the Dudlo Mfg. Co., wire manufacturer, Fort Wayne, Ind., succeeding R. A. CONNER, who has joined the sales department of the Inca Mfg. Co., Fort Wayne, Ind., wire manufacturer.

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FRANK DUNSTAN and O. B. SCHMELTZ, sales engineers formerly located at the Putnam machine works, Fitchburg, Mass., of Manning, Maxwell & Moore, Inc., have been transferred to the Pittsburgh office to assist the Arch Machinery Co. in the sale of Putnam machine tools.

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MAURICE M. WHELDON, recently identified with the Federal furnaces of the By-Products Coke Corporation, South Chicago, has been appointed assistant superintendent of blast furnaces for the Pittsburgh Steel Co., Monessen, Pa. Mr. Wheldon has had wide acquaintance with blast furnace operation, having gained his early ex-Jackson, Ohio, maker of high-silicon iron. Later he was identified for a short time with one of the Lavino furnaces in eastern Pennsylvania, but returned to the southern Ohio region to become superintendent of the Wellston Iron Furnace Co., Wellston. When this plant ceased to operate he went with the Federal furnaces.

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L. H. UNDERWOOD, for four years superintendent of blast furnaces and coke plant at the Indiana Harbor, Ind., plant, Youngstown Sheet & Tube Co., has resigned.

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W. C. WALLIS, who has been superintendent of blast furnaces at the Brier Hill works, Youngstown Sheet & Tube Co., Youngstown, has been made assistant general superintendent at that plant. P. D. CROMWELL, recently superintendent of the company's Hubbard, Ohio, blast furnaces, has been appointed superintendent of blast furnaces at the Campbell works.

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L. J. VOYER, who has been New York district sales manager for the Newton Steel Co., Youngstown, has been transferred to the home office, where he will be identified with the general sales department. F. C. FLOOD, recently identified with the company's Cleveland sales office, succeeds Mr. Voyer at New York, and W. H. WILLIAMS, who has been in the Detroit office, succeeds Mr. Flood at Cleveland.

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C. W. EDWARDS, formerly superintendent of rolling mills at the Indiana Harbor, Ind., plant, Youngstown Sheet & Tube Co., has been made assistant general superintendent at that plant. He has been identified with the company at that location for the last 12 years. GEORGE W. ABEL, who has been assistant superintendent of the slab mill at South Works, Illinois Steel Co., Chicago, has succeeded Mr. Edwards as superintendent of rolling mills at Indiana Harbor.

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FRED L. FLANDERS, vice-president, Muskegon Motor Specialties Co., Muskegon, Mich., has been elected a director of the Sparta Foundry Co. He was formerly associated with the White Motor Co. and the Continental Motors Corporation.

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MILTON GREENBERGER, president, Steel Mill Products Co., Chicago, has been elected president of the Appleton Steel Tube Co., Appleton, Wis. He succeeds JOHN M. BALLIET, who resigned because of poor health.

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DAVID B. REEDER, formerly associated with the Keystone Driller Co., has been appointed metallurgist, with offices in the Oliver Building, Pittsburgh, of the Electro Metallurgical Sales Corporation, New York.

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H. A. MASON, secretary of the Columbus Bolt Works Co., Columbus, Ohio, sailed on Oct. 19 for Europe. He will join J. R. POSTE, president of the company, who is now in London, and they will return in November.

W. R. EBERHARDT, who has been structural engineer for the H. K. Ferguson Co., Cleveland, has become manager of the New York office of the company.

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E. J. LOWRY, consulting metallurgical engineer, Detroit, spoke on "A New Material: Still Called Cast Iron" at the first fall meeting of the Newark Foundrymen's Association, to be held at the Down Town Club, Newark, on Oct. 23.

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GEORGE M. BECHTEL, heretofore of the Los Angeles office of Combustion Engineering Corporation, New York, has been made branch manager of the Seattle office of the company.

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DON MCDANIEL, vice - president, Hamilton Foundry & Machine Co., Hamilton, Ohio, has been elected president of the Ohio Foundries Association, Inc., Cleveland.

DON MC DANIEL

FRANK A. WEIDMAN has been appointed manager of the wrought iron division of the Sharon Steel Hoop Co., Sharon, Pa., to handle the development and distribution of wrought iron sheets made from Byers new process wrought iron. The perfection of the Aston process for producing wrought iron on a tonnage basis makes wrought iron sheets available, after having been practically unobtainable for two decades or more. Mr. Weidman until recently was special representative for the Inland Steel Co., Chicago. Previous to that he was with the American Sheet & Tin Plate Co. at Pittsburgh.

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H. W. LYNN, formerly connected with the Aetna-Standard Engineering Co., Youngstown, Ohio, has become manager of machine sales of the Wean Engineering Co., Inc., Warren, Ohio, engineer in sheet and tin mill equipment.

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F. P. NORRIS, who has been identified with the Phoenix Iron Co., Philadelphia, for the past 40 years, for 28 of which he has served as manager, has been appointed a vice-president of the company.

A. E. UDELL has resigned his position as general purchasing agent of the Oliver Farm Equipment Co., Chicago, and plans to go to Florida for a short stay.

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D. H. SMITH has been placed in charge of the Chicago office, at 221 East Twentieth Street, of Clark Brothers Bolt Co., Milldale, Conn.

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J. L. RHOADS, who has been associated for many years with S. F. Bowser & Co., pump and tank manufacturers, Fort Wayne, Ind, has been appointed service manager for all territories in the United States except the San Francisco district.

Hardware Jobbers Adopt Trade Practice Rules

WASHINGTON, Oct. 22. — Approximately 90 per cent of the sales by hardware jobbers in 14 Southern States is estimated to have been represented either directly or indirectly at a trade practice conference held here on Friday of last week by the Southern Hardware Jobbers' Association with Commissioner Garland S. Ferguson, Jr., and Trade Practice Director M. Markham Flannery of the Federal Trade Commission. Sixteen rules were adopted. They covered the following subjects: Interference with contracts; misbranding; fraud and misrepresentation; substitution of quality; giving of secret rebates, gratuities or premiums; selling below cost or without profit; arbitration; defamation of competitors; enticement of employees; definition of qualified distributer; datings; continuance of conference; dumping; price discrimination; free deliveries; terms of sales.

X-Ray Studies of Wire Described

Work that is being done with X-ray studies applied to wire by the American Steel & Wire Co. was discussed by F. C. Elder, chief metallurgist, Cleveland district, of that company, at the first meeting of the season of the Cleveland chapter of the American Society for Steel Treating, at the Cleveland Engineering Society rooms, Oct. 15. The meeting was attended by the Canton-Massillon chapter.

The studies discussed applied to the cold working of wire. Some of the specimens were stretched on tensile machines and others were cold drawn in dies. The talk was illustrated by lantern slides of numerous X-ray photographs. Reductions up to 99½ per cent were made in the wire by a series of light drafts. Photographs showed the effects of annealing the cold-drawn wire for 1 hr. at temperatures ranging from 700 to 1600 deg. Fahr. Wire annealed at 700 deg. showed little change in structure. At 900 deg. it began to lose its fibering. Annealed at 1000 deg. it revealed the beginning of recrystallization and the number and size of crystals increased as the annealing temperature rose. Photographs showed that cold-drawn wire was well annealed at a temperature of 1600 deg. Studies of cold-drawn wire having an 80 per cent reduction were also discussed and illustrated.

In reply to questions Mr. Elder said that the use of the spectograph is a good method of showing a good normalized structure. Referring to the practical application of the X-ray at the present stage of the art, he said that he had found the method of advantage in solving difficult problems that did not yield to microscopic studies or other methods of investigation.

Nitriding Symposium in Special Volume

In a special edition of its *Transactions* the American Society for Steel Treating has just published the complete proceedings of the memorable symposium on nitriding which was a feature of its eleventh annual convention during the National Metal Congress in Cleveland in September. The edition contains 222 pages, which include each of the eight papers and the special address by Dr. Adolph Fry of Germany, inventor of the process, who was present at the meeting. There is also a report of the written and oral discussions.

As an introduction there is a statement on behalf of the officers and board of directors by Dr. Zay Jeffries, president, and W. H. Eisenman, secretary, giving the reasons for printing this special issue. In the ordinary course of procedure the various papers would have been printed in the monthly issues of the *Transactions*. The statement also expresses appreciation to W. B. Coleman for the organization of the symposium, to Dr. George B. Waterhouse chairman of the sessions, and to the authors of the papers and those who contributed to the discussions.

The edition includes photographs of the chairman and vice-chairman of the sessions, and of Adolph Fry and Pierre Aubert, honorary vice-chairmen.

Copies of this symposium are available at $3 each, bound in cloth, postpaid in the United States, and $3.50 postpaid to foreign countries.

Obituary

HOWARD SELLERS, formerly a director of William Sellers & Co., Inc., machine tool builders, Philadelphia, died at his home at Wynnewood, Pa., on Oct. 14, aged 72 years.

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CHARLES B. SALMON, founder of the Eclipse Windmill Co., which formed the nucleus of the Fairbanks, Morse & Co. industrial organization, died at his home in Beloit, Wis., on Oct. 15, aged 79 years. He was identified with the establishment and management of numerous other large industrial enterprises and was noted for his charities and philanthropies.

September Automobile Production Down

Output of Nine Months Exceeds That for Any Previous Full Calendar Year, in Total, in Passenger Cars and in Trucks

WASHINGTON, Oct. 21. — Totaling 415,332 units, production of motor vehicles in the United States in September was the lowest since January, when the output was 401,037 units, according to reports received by the Department of Commerce. Production of passenger cars in September was 364,786, also the lowest output since January, with 347,382. Motor truck output in September was 49,681, the lightest since last December, with a total of 28,123. Production of taxicabs in September was only 865, the smallest since last November, with a total of 700.

August production of motor vehicles totaled 498,361 units, the September production showing a decline of 83,029, or 17 per cent. Passenger car output in August was 441,942, the decrease for September being 77,156. Production of trucks in August was 55,379, the September decline being 5698.

For the nine months of the current year production of motor vehicles was 4,637,471 units, an increase of 1,167,252 over the 3,470,219 in the corresponding period of last year. The current total was higher than in any previous complete calendar year.

Passenger car production increased to 4,005,177, a gain of 945,239 over the 3,059,938 vehicles in the first nine months of 1928, and higher than in any previous 12-month. Truck production rose to 618,702 units, an increase of 212,739 over the 405,963 of the first nine months of last year, and again higher than in any previous full year.

Canadian motor vehicle production in September was 13,817 units, the smallest since last December, with a total of 9425. The August output was 14,214. Passenger car production in September was 10,710 and truck production was 3107, each the lowest since last December, with totals of 6734 and 2691 respectively. August production was 11,037 and 3177 respectively.

Total Canadian production for the nine months of 1929 was 233,853, against 202,652 for the corresponding period of last year. Passenger car output was 186,960 and 168,837 respectively, while the respective figures for truck production were 46,893 and 33,815.

Pittsburgh Barge Rates to Southwest Reduced

The American Barge Line, operating a line of barges between Pittsburgh, New Orleans and intermediate ports, and also ports on the upper Mississippi River, has announced new through rates on iron and steel articles from the Pittsburgh district to western Louisiana, Texas, Oklahoma and Arkansas. These new rates will represent a net saving to shippers of $2.20 a net ton as compared with the present all-rail rate. The American company will also soon publish a Pittsburgh terminal tariff, absorbing switching and barge loading charges in that district. The new reduced rates are to hold on pipe as well as other iron and steel articles and will be effective Dec. 1.

Record Freight Traffic with Less Equipment

While the loading of revenue freight in the United States during the first seven months of the year was a new high record for that period, reaching more than 30,000,000 cars, this enormous traffic is reported by the car service division of the American Railway Association to have been handled with fewer freight cars and locomotives than have been used at any time since 1923. The number of freight cars owned by Class I railroads July 1 was 2,266,069, a reduction of 34,600 in two years.

Average capacity of the units has been increasing steadily, the freight cars having advanced from 43.1 tons five years ago to 46.1 tons. In addition, there has been more intensive use of the individual cars. There has also been a decline in the number of locomotives owned, but the average tractive power of the units has gone up. This is now reported at 43,985 lb., compared with 38,217 lb. seven years ago.

Much Industrial Machinery Shipped to Canada

WASHINGTON, Oct. 19.—In a report relating to the market for industrial machinery in the Canadian prairie provinces of Manitoba, Saskatchewan and Alberta, Consul General P. S. Heintzleman, Winnipeg, points out that the principal classes of this class of equipment imported into the three provinces are mining machinery, pulp-mill and paper-mill machinery and road-building machinery. The report has been made public by the Industrial Machinery Division, Department of Commerce.

Separate figures for imports into the provinces are not available, but it is estimated that, of the total of more than $49,220,000 of strictly industrial machinery shipped from the United States to Canada in 1928, one-fourth was destined for use in the prairie provinces. A steadily increasing volume of trade is expected, although manufacturers in Canada, it was declared, are becoming more desirous of meeting the country's requirements and equipment is gradually being installed for the manufacture locally of the different lines, thus increasing competition for the American product.

Other competitors are principally the United Kingdom and, to a much less extent, Germany, Sweden, France, Norway and Switzerland. Pulp-mill machinery, coke and gas-producing machinery, textile machinery and briquette-making machinery are the items principally involved in this competition.

Mr. Heintzleman reported that, since one-tenth of the population of the prairie provinces is American-born, and further because of the proximity of the provinces to the United States and the easy access between the peoples of the two countries, there is naturally a marked preference for industrial machinery of American manufacture. The report deals at some length with the best methods for American manufacturers to follow in building up the markets in the provinces.

COMING MEETINGS

OCTOBER

Society of Industrial Engineers. Oct. 23 to 25. Sixteenth national convention, Hotel Statler, Cleveland. George C. Dent, 205 West Wacker Drive, Chicago, secretary.

American Gear Manufacturers Association. Oct. 24 to 26. Fall meeting, Benjamin Franklin Hotel, Philadelphia. T. W. Owen, 3608 Euclid Avenue, Cleveland, secretary.

American Iron and Steel Institute. Oct. 25. Thirty-sixth general meeting, Hotel Commodore, New York. E. A. S. Clarke, 75 West Street, New York, secretary.

American Management Association. Oct. 29 to Nov. 1. Fall meeting, Hotel Statler, Detroit. W. J. Donald, 20 Vesey Street, New York, managing director.

NOVEMBER

Open-hearth Committee of American Institute of Mining and Metallurgical Engineers. Nov. 5 and 6. Semi-annual meeting, Hotel Stevens, Chicago. Leo F. Reinartz, American Rolling Mill Co., Middletown, Ohio, chairman.

International Acetylene Association. Nov. 13 to 15. Annual meeting, Congress Hotel, Chicago. A. Cressy Morrison, 30 East Forty-second Street, New York, secretary.

American Institute of Steel Construction. Nov. 13 to 16. Annual meeting, Edgewater Gulf Hotel, Biloxi, Miss. Charles F. Abbott, 200 Madison Avenue, New York, executive director.

National Founders' Association. Nov. 20 and 21. Annual meeting, Hotel Astor, New York. J. M. Taylor, 29 South LaSalle Street, Chicago, secretary.

Quiet Prevails in European Markets

Even Pig Iron Is Less Active—Japan Has Expanded Operations—Russia Seeks More Technical Assistance

(By Cable)

LONDON, ENGLAND, Oct. 21.

PIG iron is quiet and Cleveland makers are becoming apprehensive of the future. Ironstone miners are pressing for a wage advance, but the mine owners are unwilling to discuss the question at present, as costs are still very high.

Export sales of Cleveland iron are negligible and foreign basic iron is again arriving in small tonnages for British consumers. Meanwhile, Cleveland makers have sold their October output, but have no forward contracts, and it is possible that some furnaces may be blown out at a later date.

Hematite makers are securing business at unprofitable prices, but are unable to advance the market, as French hematite is again competing.

Finished steel is quiet, but mills are busy on orders received prior to the latest steel makers' meeting, and specifications are coming in freely.

Tin plate is quiet, both manufacturers and consumers being disturbed by the recent set-back in the tin market, so that business is only moderate. Demand is good for light weight 14 x 20-in. wasters for the Far East and supplies are scarce, but other business is quiet although inquiry is well maintained.

Galvanized sheets are weak on poor demand and reduced costs of production in the form of lower priced sheet bars and spelter. Black sheets are dull.

Continental iron and steel markets are weak, with mills eagerly seeking business. Some British users of foreign sheet bars have placed orders, but the tonnage has been small. Finished steel is especially quiet in the absence of good export demand.

Czechoslovakian production in August was 137,000 metric tons of pig iron, and 185,000 tons of raw steel. French production in August was 893,000 metric tons of pig iron and 872,000 tons of raw steel. At the end of August 156 French furnaces were in blast. German pig iron output in September was 1,109,000 metric tons with 100 furnaces in blast at the end of the month.

British Trade Remains Quiet —Foreign Prices Lower

LONDON, ENGLAND, Oct. 11.—The iron and steel markets continue dull and there is but slight indication of a change for the better. The volume of new tonnage on mill books, except in pig iron, is not sufficient to maintain better than part-time operation. Blast furnaces, however, are generally well sold ahead and in some cases have advanced prices. The Cleveland producers have not as yet altered quotations, but are expected to do so shortly, as costs of production are increasing. A deterrent is the fact that they are seeking to increase export sales, and foreign users are reluctant to pay even the present prices. Domestic pig iron demand is good, but Continental iron, while still imported in special cases, is generally not an attractive proposition.

In the semi-finished market the rapid decline in the price of foreign billets and sheet bars is affecting domestic producers. British mills have for some time had a fair share of this business, but Continental competitors are becoming more active. However, Continental mills are in need of orders for prompt and early shipment, while British consumers are generally well covered on their immediate requirements and are seeking supplies for next year only.

Export trade is quiet. It is reported that a moderate amount of Canadian business in finished material has been booked as a result of efforts by the Steel Makers' Export Committee, and some business has been received from Japan. While prices are not disclosed, it is known that the market must be shaded considerably to meet Continental competition.

Returns of the Clyde shipbuilding industry for September were small, and the volume of new ship construction contracts is not good, so that shipyards are not likely to require large quantities of ship steel in the near future. There are, however, large electrical, structural and railroad projects, which call for substantial quantities of steel and other material.

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.85

British Prices, f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3	12½s.	to £3	13½s.	$17.58	to	$17.82
East Coast hematite	3	16½	to 3	17	18.51	to	18.63
Ferromanganese, export	13	10	to 14	0	65.47	to	67.90
Billets, open-hearth	6	5	to 6	7½	30.31	to	30.92
Sheet bars, open-hearth	6	5	to 6	10	30.31	to	31.52
Black sheets, Japanese specifications	12	12½			61.22		
Tin plate, per base box	0	19	to 0	19¼	4.60	to	4.66
Rails, 60 lb. and heavier	7	15	to 8	15	37.59	to	42.43
					Cents per Lb.		
Steel bars, open-hearth	7	15	to 8	10	1.67	to	1.84
Beams, open-hearth	7	2½	to 7	12½	1.55	to	1.65
Channels, open-hearth	7	7½	to 7	17½	1.60	to	1.71
Angles, open-hearth	8	2½	to 8	12½	1.76	to	1.86
Ship plates, open-hearth	7	12½	to 8	2½	1.66	to	1.76
Black sheets, No. 24 gage	10	0	to 10	5	2.17	to	2.21
Galvanized sheets, No. 24 gage	13	0	to 13	7½	2.81	to	2.89

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3	8s.	to £3	11½s.	$16.49	to	$17.33
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3	8	to 3	10	16.49	to	16.97
Billets, Thomas	4	13	to 4	15	22.65	to	23.03
Sheet bars, Thomas	4	13	to 4	14	22.65	to	22.79
Wire rods low C., No. 5 B.W.G.	6	5	to 6	6¼	30.30	to	30.61
Black sheets, No. 31 gage, Japanese	12	6	to 12	7½	59.65	to	60.02
Rails, 60 lb. and heavier	6	8½	to 6	10*	31.16	to	31.52
Rails, light	6	1½			29.46		
					Cents per Lb.		
Steel bars, merchant	5	2	to 5	3	1.10	to	1.11
Steel bars, deformed	5	1	to 5	2	1.09	to	1.10
Beams, Thomas, British standard	4	19	to 5	3	1.07	to	1.11
Channels, Thomas, American sections	5	14	to 5	18	1.24	to	1.27
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	5	0			1.10		
Angles, Thomas 3-in.	5	7			1.15		
Ship plates, open-hearth inspected	7	8			1.63		
Hoop and strip steel over 6-in. base	5	10	to 5	12	1.19	to	1.21
Wire, plain, No. 8 gage	7	4	to 7	5	1.58	to	1.59
Wire, galvanized, No. 8 gage	8	17½			1.91		
Wire, barbed, 4-pt. No. 12 B.W.G.	11	5			2.43		
Wire nails, base	7	10	to 7	10½	$1.62	to	$1.63	per keg
Wire nails, assortments, 1 to 6-in., keg	10	6½			2.23		

*Open-hearth steel, 10s. ($2.42) per ton extra.

Germany Imports Scrap Cans for Detinning

HAMBURG, GERMANY, Oct. 7.—Detinning of scrap tin plate in Germany is handicapped by a shortage of scrap and a diminishing recovery of tin, as a result of improved methods of plating, which provide a thinner tin coating. Recently scrap tin cans have been imported from the United States, Great Britain, Australia and the Far East. Some increase in the supply available for detinning is expected from the decision of certain municipalities to devote more attention to classifying this part of their scrap separately.

Most of the detinning in Germany is done by one company, Goldschmidt of Essen. Although the coating of tin plate is thinner than formerly, profits from the detinning process have continued at about the same level, following improvements in the method of recovering the tin. While accurate statistics are not available, it is estimated that about 14.5 kg. 32 lb.) of tin per metric ton of scrap is recovered. The total production of tin by this method in 1928 was about 2,755,000 lb., or 1250 metric tons.

Iron and Steel Output of Hungary Increasing

WASHINGTON, Oct. 18.—Increased demand from the Hungarian machinery industry and greater exports caused an increase in the production of both pig iron and crude steel during the first six months of 1929, according to a report received by the Department of Commerce from Budapest. Output of pig iron for the first half of the current year was 184,320 metric tons, compared with 136,857 tons for the first half of last year. Crude steel production was 241,440 tons, compared with 223,500 tons.

Scrap Prices Reduced in Germany

HAMBURG, GERMANY, Oct. 7.—Prices of iron and steel scrap have again been reduced. No. 1 heavy melting steel is now quoted at 64 m. ($15.23) per metric ton, delivered. Other grades of scrap have also been reduced 1 to 2 m. (24c. to 48c.) per ton. During August imports of scrap totaled 47,000 tons, but there is an abundant supply, and importation is expected to decline at the new prices.

Belgian Exports Light—Electrical Merger Near

BRUSSELS, BELGIUM, Oct. 2.—Steel export business in the past fortnight has been quiet and the price per gross ton for steel bars, f.o.b. Antwerp, has declined to £5 7s. ($25.95), which is 5s. ($1.21) per ton below the price at the end of August. Except for some small orders from Argentina, little foreign business has been booked. Business is fairly good in semi-finished material, but lack of demand for finished products may cause slight curtailment by some mills. Iron and steel scrap prices have weakened slightly. Export prices are low, and Belgian sellers have been unable to obtain business in South American markets and Japan except by offering concessions.

German Chemical Industry May Make Rustless Iron

HAMBURG, GERMANY, Oct. 7.—It is currently reported that the I. G. Farben A. G., the German Dyestuffs Corporation, is planning the establishment of a rustless iron division, which will manufacture equipment for use in the chemical industry. The use of rustless iron in the chemical industry has become so large that it is believed that a plant manufacturing equipment under the Krupp-Nirosta patents would be profitable.

German Cable Makers May Build American Plant

HAMBURG, GERMANY, Oct. 7.—A cooperative export corporation has been established in Berlin by 10 German cable manufacturers. While the new company will handle sales of cable to foreign markets, its principal purpose is understood to be the establishment of plants in foreign countries where duties are too high to permit cable imports. At present the new company is considering plans for a cable manufacturing plant in the United States. Exports of cable from Germany this year have averaged 5000 tons a month.

Japan's Pig Iron Output 753,591 Tons in Half

YOKOHAMA, JAPAN, Sept. 11.—The leading producers of pig iron in Japan are the Government Steel Works and the South Manchuria Railroad Co. Of 753,591 metric tons of iron produced in the first half of this year, the Government works output was 403,779 tons and the South Manchuria Railway Co.'s production 111,368 tons. Other producers were the Mitsubishi Steel Co. with 76,804 tons, Japan Steel Works with 57,912 tons, Okura Mining Co. with 28,145 tons and the Asano Shipbuilding Co. with 29,281 tons.

Despite this heavy production of pig iron, importation is necessary. The Government Steel Works program for 1930 calls for a steel production of more than 1,350,000 metric tons, while its pig iron capacity is not more than 860,000 tons.

Czech Iron Output Rises

WASHINGTON, Oct. 15.—Production of pig iron in Czechoslovakia in August increased to 138,000 tons, but steel production decreased to 185,000 tons, according to a cablegram received by the Department of Commerce from Prague.

Japanese Sheet Exports Reach Many Markets

YOKOHAMA, JAPAN, Sept. 11.—Exports of galvanized sheets from Japan in August totaled 5028 metric tons, of which 3187 tons was flat sheets and 1840 tons corrugated. The official statistics are given in number of sheets, and the totals with destinations were as follows: To South Sea countries, 505,402 sheets; to China, 225,617 sheets; Kwantung Province, 225,010 sheets; Siam, 147,142 sheets; Manchuria, 41,499 sheets; Hong Kong, 40,700; British India, 15,626; Philippines, 5800, and to Asiatic Russia, 5600 sheets. The total was 1,212,296 sheets, or 5028 metric tons.

German Mills to Issue New List of Extras

DÜSSELDORF, GERMANY, Oct. 7.—Rolling mills are preparing a new list of extras on steel bars and shapes for export. For some time the extras charged have not corresponded to the standard list by several shillings a ton. For example, on 3/16-in. bars the standard size extra is 25s. per ton (27.5c. per 100 lb.), and on ¼-in., the average standard extra is 17s. 6d. a ton (19.5c. per 100 lb.). On recent export business the usual extra on both sizes has been about 10s. per ton (10.9c. per 100 lb.). Extras charged on light angles, tees and other shapes are also less than the present standard list.

Britain May Exceed Rail Quota with New Contract

HAMBURG, GERMANY, Oct. 7.—The agreement between Great Britain and Argentina, under which about £8,000,000 ($38,800,000) of rails and railroad material will be placed with British mills, may lead to Britain's exceeding its quota in the International Rail Manufacturers' Association. As British mills, under the agreement, will receive all rail orders placed by Argentina, the British allotment in the association may be exhausted soon and orders from the British dominions and colonies would be in excess of the quota. Meanwhile, Belgian and Luxemburg mills have declared themselves opposed to any increase in the allotment of a member.

German Mannesmann Not in Control of Saar Mill

The recent report from Germany that the German Mannesmann Tube Co. had acquired control of 65 per cent of the stock of the French Mannesmann mill, Acieries et Usines a Tubes de la Sarre, is stated to be incorrect by Louvroil & Recquignies, Paris. This company owns 34 per cent of the stock of the Mannesmann mill in the Saar and states that other French tube manufacturers control 26 per cent, while the German Mannesmann company owns the remaining 40 per cent.

More Russian Agreements with American Companies

HAMBURG, GERMANY, Oct. 7.—At a recent meeting of delegates from the South Russian Chambers of Commerce and German manufacturers, the head of the Russian foreign trade department, the Gurewitch, outlined the status of technical assistance agreements in Russia. In the past four years, he said, 71 such agreements had been made, of which 30 were with German companies, 17 with American and the rest with British, Swedish and French organizations. He pointed out that the trend is toward more agreements with American companies, because they are less secretive about improvements in their plants than companies in Germany and other countries.

Spiegeleisen Imports Mainly from Britain

Of the total imports of 11,243 gross tons of spiegeleisen into the United States to Aug. 1, this year, 10,868 tons came from Great Britain and 375 tons from Germany.

Of the 10,868 tons of British alloy, 3543 tons was received through the port of New Orleans, 2550 tons through the port of Philadelphia, 2235 tons through ports in Maryland, 2000 tons at Chicago, 240 tons through ports in Massachusetts, 135 tons at Los Angeles, 90 tons through ports in Washington, 50 tons through New York and 25 tons at San Francisco. The 10,868 tons of British alloy had a valuation of $314,490, or $28.94 per ton. The 375 tons of German alloy had a valuation of $12,320, or about $32.85 per ton. All of it came through the ports of San Francisco and Los Angeles.

German Rail Prices Cut

HAMBURG, GERMANY, Sept. 30.—The official price of £6 17s. 6d. ($33.34) a ton for rails was left unchanged by the International Rail Makers' Association at its recent meeting in Vienna, but German mills, which sold rails at £7 ($33.95) a ton during the second and third quarters of this year, have reduced their price to £6 18s. 6d. ($33.58) a ton, which is still 1s. a ton more than the official price. Mills continue to report satisfactory business in rails.

Swedish Sponge Iron Plant Increases Capacity

The Höganäs Co. of Sweden, maker of sponge iron, considerably increased its capacity during the spring and summer because of an increased demand for its product. It is stated that recently orders were so heavy, during rebuilding of the plant, that new business could not be accepted. Importers in this country have received word that the new units for producing sponge iron have had their trial run and are now in satisfactory condition to proceed with production. In the proposed new tariff sponge iron has been listed in a special paragraph for a duty of $2 per ton; under the present tariff it comes in under the same duty as pig iron.

Soviet to Adopt American Coal Mining Methods

The Donugol Coal Trust, the largest coal mining unit in the U. S. S. R., operating about 300 mines in the Donetz Basin, has concluded a fourth technical assistance contract with an American company. The new agreement, which is with Stuart, James & Cooke, Inc., New York, provides for assistance in increasing the efficiency of operation in the mines and plants.

This is the first contract of its kind made by a Russian Government organization, 30 other technical agreements having been for designing or building new plants. Stuart, James & Cooke, Inc., is already acting as a consultant for the Moscow Coal Trust and other coal companies in Russia.

Large Laboratories for Research in Canada

Large research laboratories have been authorized by the Dominion Government of Canada. The initial expenditure for these laboratories was fixed at $1,000,000, but it is now intended to proceed with the whole enterprise at a cost of $3,000,000. Tenders for the laboratory building, which is to be built in Ottawa, will soon be asked for, the specifications having been already prepared by the architects.

G. S. Whitby, professor of organic chemistry, McGill University, Montreal, will be director of the department of industrial chemistry. R. W. Boyle, professor of physics and dean of the faculty of applied science at the University of Alberta, will be director of the department of physics and engineering physics. J. H. Parkin, associate professor of mechanical engineering at the University of Toronto, will be assistant director of the department of physics and engineering physics in charge of aeronautical research.

To Expand Aluminum Output

HAMBURG, GERMANY, Oct. 7.—Further expansion of aluminum production in Germany is in prospect, and the Lautawerk, the largest producer, has made preliminary plans for another plant, with a capacity of 8000 to 10,000 tons a year. It is estimated that consumption of aluminum in Germany this year will total about 41,000 metric tons, compared with 37,800 tons in 1928, and that production will be about 35,000 tons, compared with 30,500 tons in 1928. An effort is being made to supply all German aluminum requirements from domestic production. It is noteworthy that in 1913 production of aluminum in Germany was only 1000 tons and consumption was 13,300 tons.

German Copper Output Up in August

HAMBURG, GERMANY, Sept. 30.—Copper production in Germany reached a new record in August with a total of 10,214 metric tons, compared with 9752 tons in July. Of the August output, 5130 tons was smelted from German ores.

Brazilian Steel Industry

Active development work in extracting iron ore from deposits in the State of Minas Geraes, Brazil, is reported to be in progress by the Itabira Iron Ore Co. This organization holds a concession from the Brazilian Government which requires prosecution of the work, according to the United States commercial attaché at Rio de Janeiro. To reach the ore beds, engineers are locating a route for new sections of the Victoria-Minas Geraes Railroad. Preliminary work on docks is under way at the port of Santa Cruz and also on the mining plant itself in the Doce River district.

The simplified practice recommendation for woven wire fencing has been reaffirmed. The pamphlet covering this recommendation may be obtained for 5c. from the Superintendent of Documents, Washington.

Production, Shipments, Consumption and Orders of Raw and Finished Materials

	September, 1929	August, 1929	September, 1928
Portland cement made(a), bbl.(b)	17,223	18,585	17,884
do., nine months(a)(b)	128,165(c)	.....	131,178
do., shipments(a), bbl.(b)	19,950	23,052	20,460
do., nine months(a)(b)	133,545(c)	.....	136,284
Babbitt metal consumed(d), net tons	2,613	2,716	2,654
Bituminous coal(a), net tons(b)	44,515	43,889	41,971
Bituminous coal(a), nine months, net tons(b)	380,250	.....	351,174
Anthracite(a), net tons(b)	6,792	5,954	5,927
Anthracite(a), nine months, net tons(b)	54,248	.....	54,240

(a) United States Bureau of Mines.
(b) Thousands.
(c) First recession since 1921.
(d) United States Department of Commerce.

Machinery Markets and News of the Works

Sales Show Improvement

Individual Orders Have Been Small, But Have Come from Almost All Consuming Lines

AGAIN in sales is reported by some machine tool builders who booked considerable business the past week.

However, there is a noticeable absence of buying on a large scale, individual orders having consisted largely of from one to three machines each. With the exception of the automobile industry, where tool purchases are almost at a standstill, bookings have been drawn from almost all consuming industries.

Despite the past week's improvement, the volume of business is lagging somewhat behind that in September. Production is not being affected, for the industry's backlog will carry operations along at capacity until well into next year.

An automobile truck maker has expended $35,000 for tools and a company in the Detroit district has bought four large automatic lathes from a Cincinnati builder. The Worthington Pump & Machinery Corporation is expected to contract for upward of $60,000 worth of equipment in the near future.

Among recent purchases by the Amtorg Trading Corporation for a tractor plant in Soviet Russia were a large number of presses from an Ohio manufacturer.

The United States Aluminum Co. has issued a supplementary list of tools which it will buy for its New Kensington, Pa., plant. The A. M. Byers Co. may inquire for machinery and other equipment for its Ambridge, Pa., works in the next few weeks, although purchases will be delayed until late in the year.

The Western Electric Co. continues to contract for large quantities of machine work and jobbing shops in the Chicago district are profiting from this situation.

New York

NEW YORK, Oct. 22.—Machine tool sales are holding up fairly well. Inquiries are in promising volume. A motor truck manufacturer has placed orders for upward of $35,000 worth of equipment. The Worthington Pump & Machinery Corporation, Harrison, N. J., is expected to close shortly on about $65,000 worth of tools.

Queens County Motor Car Co., 103 Arleigh Road, Douglaston, N. Y., has plans for a six-story service, repair and garage building at Briarwood, N. Y., to cost more than $200,000 with equipment. Henry C. Brucker, 2424 Myrtle Avenue, Brooklyn, is architect.

New York Edison Co., Irving Place and Fifteenth Street, New York, has arranged a fund of $40,500,000, out of total appropriation of $80,000,000 for new construction, for extensions and improvements in transmission and distributing lines, including underground conduit installation and network systems.

United States Electric Mfg. Corporation, 222 West Fourteenth Street, New York, manufacturer of electrical equipment, has leased building at 154-56 West Nineteenth Street, for expansion.

Curtiss Flying Service, Inc., 39 Broadway, New York, will soon begin work on new airport near municipal airfield at Los Angeles, including eight steel hangars, machine and repair shop, laboratories, school for students and other field units, to cost over $1,000,000 with equipment.

American Radiator & Standard Sanitary Corporation, 40 West Fortieth Street, New York, is closing negotiations for acquisition of C. F. Church Mfg. Co., manufacturer of plumbing and bathroom fixtures, etc., and will consolidate. Purchased company has plants at Washington, N. J., Holyoke, Mass., and Brattleboro, Vt., all of which are to be continued. Expansion is planned.

Phono-Kinema Syndicate, Inc., 729 Seventh Avenue, New York, manufacturer of sound equipment for motion pictures, etc., has arranged for sale of 100,000 shares of common stock, part of proceeds to be used for expansion in production.

Yankee Metal Products Co., 200 Fifth Avenue, New York, has leased floor in building at 460 West Thirty-fourth Street for expansion.

Board of Education, Park Avenue and Fifty-ninth Street, New York, has purchased property at St. Marks Place, Wall Street and Belmont Place, St. George, S. I., as site for new vocational school to cost over $500,000, for which plans will be drawn by W. C. Martin, school architect, Flatbush Avenue Extension and Concord Street, Brooklyn.

Continental Can Co., 1 Pershing Square, New York, has purchased Nashville Corrugated Box Co., Nashville, Tenn., manufacturer of corrugated shipping containers, etc., and will operate as unit of organization. Expansion in output is planned. Company has also merged with Owens-Illinois Glass Co., Toledo, Ohio, manufacturer of glass containers. A new company has been formed to operate consolidated organization under name of Continental Containers, Inc. Increase in present manufacture is planned.

Thomas A. Edison, Inc., West Orange, N. J., has awarded a general contract to Austin Co., New York, for new plant on Kearny meadows, Kearny, N. J., to manufacture storage batteries, comprising four one and two-story units, 120 x 280 ft.; 60 x 90 ft.; 30 x 47 ft.; and 80 x 80 ft., last-noted to be used as power house, to cost $220,000 with equipment.

Ford Motor Co., Detroit, has asked bids on general contract for new assembling plant at Edgewater, N. J., to replace works at Kearny, N. J., recently sold to Western Electric Co. Main unit will be two stories, 360 x 1500 ft., with steam power house, 50 x 113 ft., and auxiliary units, to cost over $1,000,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Board of Freeholders of Passaic County, Court House, Paterson, N. J., is considering County airport on Paterson-Hamburgh Turnpike, Preakness, consisting of hangars, repair shop, oil storage and other mechanical units, to cost $200,000 with equipment.

Tungsten Electric Co., Union City, N. J., has been formed to take over and consolidate International Wire Co., Inc., Callite Products Co., Precision Metal Products Co., Independent Contact Mfg. Co., all with plants at 540 Thirty-ninth Street, Union City. New company is arranging for sale of stock to total $955,000, part of fund to be used to carry out merger and for expansion in output.

United States Rubber Co., Broadway and Fifty-eighth Street, New York, has asked bids on general contract for a five-story and basement plant, 110 x 425 ft., at Paterson, N. J., to cost about $800,000 with equipment. Lockwood Greene Engineers, Inc., 100 East Forty-second Street, New York, is architect and engineer.

Manufacturers Electro-Plating Co., 303 New Brunswick Avenue, Perth Amboy, N. J., has opened a plant to engage in general plating, specializing in chromium and cadmium plating.

International Stamping & Enameling Corporation, 360 Furman Street, Brooklyn, has been organized to manufacture enameled products, especially for hospitals and sick rooms. It plans to purchase controlling interests in stamping

companies equipped to do such work and has acquired a major interest in one such company and is negotiating with others. It will also purchase dies and stamping machinery for products for which it can create a market.

South Atlantic

BALTIMORE, Oct. 21.—Bids will be asked early in November by Stonleigh Stores Corporation, 810 North Charles Street, Baltimore, for five-story automobile service, repair and garage building, with addition of three stories underground, 190 x 194 ft., to cost $1,500,000 with equipment. Wyatt & Nolting, Keyser Building, are architects.

Public Improvement Commission, City Hall, Baltimore, is considering installation of manual training equipment in four-story junior high school on Harrington Road, for which bids will be asked on general contract in 60 to 90 days, to cost $1,000,000. Smith & May, Calvert Building, are architects.

Automatic packing machinery, conveying, elevating and other equipment will be installed in four and six-story addition to plant of American Tobacco Co., Richmond, Va., 128 x 270 ft., to cost about $2,500,000, of which more than $1,500,000 will be used for machinery. A steam power house with capacity of 2000 hp. is also under consideration. J. E. Sirrine & Co., Greenville, S. C., are architects and engineers. Executive offices of company are at 111 Fifth Avenue, New York.

Curtiss Flying Service, Inc., 39 Broadway, New York, is planning construction of hangar, with repair and reconditioning facilities, at municipal airport at Columbia, S. C., to cost about $100,000 with equipment.

Bedford Pulp & Paper Co., Mutual Building, Richmond, Va., has begun construction of steam-operated electric power plant at mill at Big Island, Va., to cost over $100,000 with equipment.

Anchor Post Fence Co., Eastern Avenue and Kane Street, Baltimore, manufacturer of iron fencing, has purchased plant and business of Fluid Heat Corporation, 2637 Greenmount Avenue, manufacturer of oil burning equipment and devices, and will consolidate. New line of manufacture will be continued and it is proposed to remove acquired plant to main works where expansion will be carried out and department established for oil burner production. J. R. Ellison is production manager in charge.

William Hellbach & Co., 409 Aisquith Street, Baltimore, plumbing and heating equipment and supplies, have awarded general contract to West Construction Co., Knickerbocker Building, for two-story storage and distributing plant with shop, to cost about $30,000 with equipment. Kubitz & Koenig, Emerson Tower Building, are architects.

Proctor Mfg. Co., Baltimore, has been organized to take over and operate Proctor Screen & Weatherstrip Co., with local plant at 3601-11 Elm Avenue. Plans are under way for extensions and installation of additional equipment.

Pitcairn Aviation, Inc., Land Title Building, Philadelphia, has awarded general contract to Birmingham Construction Co., 1612 North Thirty-fourth Street, Birmingham, for hangar, 120 x 120 ft., at airport at Atlanta, Ga., with repair facilities, to cost about $65,000 with equipment. John K. Ottley, Jr., Fourth National Bank Building, Atlanta, is company representative in charge.

The Crane Market

THE volume of inquiry for locomotive cranes has increased in the past week, but buying has been small. Stevens & Wood, Inc., engineer, New York, has closed on a locomotive crane for the Saginaw River development in Michigan and the New York Central Railroad has purchased a 25-ton locomotive crane for use in Ohio, but still has pending a 25-ton, gasoline driven crane for use in Pennsylvania and a 50-ton locomotive crane. Inquiry for overhead traveling cranes is good, but purchasing in this field also has been light, although a number of small orders has been placed recently with but little competitive bidding.

Among recent purchases are:

Union Shipbuilding Co., Baltimore, two 10-ton, 60-ft. span overhead cranes from a Western builder.

General Electric Co., Schenectady, N. Y., two 10-ton, one 35-ft. and the other 55-ft span overhead cranes from an unnamed builder.

New York Central Railroad, 25-ton locomotive crane for use in Ohio from Ohio Locomotive Crane Co.

Jones & Laughlin Steel Corporation, Pittsburgh, two mill-type cranes from Cleveland Crane & Engineering Co., and two ladle cranes from Alliance Machine Co.

Wheeling Steel Corporation, Wheeling, W. Va., two ladle cranes from Alliance Machine Co.

American Oil Co., American Building, Baltimore, will soon begin work on oil storage and distributing plant at West Bridgewater, Pa., to cost about $40,000 with equipment. T. J. O'Connell is company engineer.

Philadelphia

PHILADELPHIA, Oct. 21.—Bids have been asked on general contract by Electric Service Supplies Co., Seventeenth and Cambria Streets, Philadelphia, manufacturer of electrical equipment, for addition to plant, to cost over $45,000 with equipment. Conrad Neff, Philadelphia, is architect.

Grinnell Co., Providence, R. I., manufacturer of fire extinguishers, piping systems, etc., will soon begin work on new factory branch and distributing plant at Philadelphia, to cost over $65,000 with equipment. Local headquarters are in Commercial Trust Building.

Sun Oil Co., 1608 Walnut Street, Philadelphia, is considering construction of four new units at refining, storage and distributing plant at Marcus Hook, Pa., to be used primarily for enlarged output of high-test gasoline, to cost over $1,000,000 with machinery.

Philadelphia & Reading Coal & Iron Co., Reading Terminal, Philadelphia, will soon begin work on second electrically-operated coal breaker at St. Nicholas, Pa., in connection with expansion and electrification of coal properties for which an appropriation of $19,000,000 has been arranged; new unit will supplement another centralized breaker now in course of construction at Locust Summit, Pa., scheduled for completion early in next year. Work will include electrification of all transportation facilities at mines, electric hoists and conveyors, ventilating fans and equipment, pumping and power machinery. Stone & Webster Engineering Corporation, 49 Federal Street, Boston, is engineer.

Atlantic Refining Co., 260 South Broad Street, Philadelphia, has acquired waterfront property at New Haven, Conn., and plans new oil refining, storage and distributing plant, with 500-ft. pier equipped with mechanical loading and handling facilities, to cost about $450,000 with equipment.

Keystone Aircraft Corporation, Bristol, Pa., a unit of Curtiss-Wright Corporation, Buffalo, is contemplating expansion, to include erection of several one-story units for commercial plane manufacture, including parts and assembling divisions. Parent company proposes to transfer a large volume of commercial aircraft manufacture to this point, including multi-passenger airplanes. Expansion will cost more than $250,000. C. L. Roloson is vice-president and works manager at Bristol.

Standard Oil Co. of Pennsylvania, Sixth and Chestnut Streets, Philadelphia, has awarded general contract to Charles Cump, Kenwood Avenue, Chambersburg, Pa., for oil storage and distributing plant at Chambersburg to cost about $50,000 with equipment.

Safe Harbor Water Power Corporation, recently organized as subsidiary of Pennsylvania Water & Power Co., Holtwood, Pa., with headquarters in Lexington Building, Baltimore, has plans for hydro-electric power project at Safe Harbor on Susquehanna River, about eight miles from plant at Holtwood, to cost about $30,000,000 with steel tower transmission system. J. E. Aldred is president.

American Manganese Fertilizer Co., 1030 Vermont Avenue, N. W., Washington, Frank R. Porter, secretary, recently formed with capital of $500,000, has acquired six-acre tract at Alexandria, Va., heretofore held by Virginia Shipbuilding Corporation, and is contemplating construction of plant for production of commercial fertilizers, to cost over $85,000 with machinery.

Pittsburgh

PITTSBURGH, Oct. 21.—Machine tool orders were only moderate the past week, but additional inquiry has appeared and the volume of pending business is as great as at any time during the year. Among the larger inquiries before the trade are those of the Westinghouse Electric & Mfg. Co. and the Norfolk & Western. The United States Aluminum Co., which recently placed a sizable list of tools for its New Kensington plant, has issued a smaller supplementary list. The Baltimore & Ohio is also inquiring for a few miscellaneous items but otherwise railroad inquiry is rather limited.

Inquiry for machinery and equipment for the Ambridge plant of the A. M. Byers Co. is expected within the next few weeks, although purchase will be delayed until late in the year. National Tube Co. will also be a large buyer toward the end of the year, although inquiry has not yet appeared for the machine tools required for its new McKeesport plant. Other large prospective equipment purchases are still dormant, but crane buying has been active and the placing of crane orders usually precedes machinery buying by only a few months.

Plans are being considered by United States Chain & Forging Co., Union Trust

Building, Pittsburgh, for addition to plant at McKees Rocks, to cost about $45,000 with equipment.

Mutual Telephone Co., 24 East Tenth Street, Erie, Pa., will take bids for a one and two-story equipment storage and distributing plant with electrical and mechanical repair departments, and automobile service and repair shop, to cost $175,000 with equipment. Myers & Johnson, Commerce Building, are architects.

Manion Steel Barrel Co., Rouseville, near Oil City, Pa., will begin superstructure for a one-story plant unit, 50 x 100 ft., to cost about $45,000 with equipment. General contract has been let to L. O. Bouquin, 13 East First Street, Oil City. D. S. Manion is president.

Board of Public Education, Bellefield Avenue and Forbes Street, Pittsburgh, H. W. Cramblet, secretary, is asking bids until Nov. 6, for equipment for Clifford B. Connelly Trade School.

Cohen Auto Parts Co., 150 East Ninth Street, Erie, Pa., has awarded a contract to George Hart, 1011 Twenty-ninth Street, for one-story plant, to cost $35,000 with equipment. Shutts & Morrison, Marine Bank Building, are architects.

United Zinc Smelting Corporation, 233 Broadway, New York, is said to be planning extensions and improvements in plant at Moundsville, W. Va., with installation of additional equipment, to cost $175,000.

New Kanawha Power Co., a subsidiary of Union Carbide & Carbon Corporation, 30 East Forty-second Street, New York, is considering hydroelectric power plant at Hawks Nest, near Gauley Junction, W. Va., on New River, to develop capacity of 100,000 hp., to cost more than $2,000,000 with transmission system. Company also plans another development on same river at Sandstone Falls, to cost about $750,000.

Barium Reduction Corporation, Charleston, W. Va., plans branch sodium sulphate plant at Horseshoe Lake, near Ormiston, Sask., to cost more than $400,000 with machinery, to be ready for service in six to eight months.

Buffalo

BUFFALO, Oct. 21.—American Roto-Floor Corporation, care of Rupert Swinnerton, Eleanor Apartments, Niagara Falls, N. Y., representative, manufacturer of steel rotating floors for commercial garages, etc., is contemplating new plant to cost more than $75,000 with equipment. Company has been carrying out production for some time at local works of Niagara Steel Finishing Co.

Brewer-Tichenor Corporation, Cortland, N. Y., manufacturer of automobile accessories and equipment, will build two new plant units, for which general contract has been let to Austin Co., Cleveland, consisting of one-story machine shop, 60 x 80 ft., and one-story forge shop, 75 x 100 ft.; a one-story extension to storage and distributing building will also be erected, 35 x 75 ft., entire project to cost more than $125,000 with equipment. Two traveling cranes of 5 and 12-ton capacities will be installed in addition to other equipment.

Hanau Engineering Co., Inc., Buffalo, has been organized to take over and expand local company of same name, with plant at 951 West Ferry Street, manufacturer of dental instruments and kindred precision equipment. Rudolph L. Hanau and J. L. Stern are heads.

Town of Amherst, Central School District No. 1, A. A. Cushing, 69 Chassin Avenue, Eggertsville, N. Y., in charge, is considering installation of manual training equipment in new high school at Amherst, for which bids have been asked on general contract, to cost $450,000. Paul H. Harbach and James W. Kideney, 271 Delaware Avenue, Buffalo, are architects.

George J. Egan, 414 Woodward Avenue, Buffalo, and Herbert H. Streng, 187 Crosby Street, Kenmore, N. Y., have organized Egan & Streng, with capital of 200 shares of stock, no par value, and will operate local plant for production of machinery and parts.

North East Appliance Corporation, Rochester, N. Y., has been organized by General Motors Corporation to take place of former North East Electric Co., recently purchased by General Motors Corporation. Directors of new corporation are Anthony H. Russo, Aloysius F. Powers, and Henry W. Hogan, all of 1775 Broadway, New York. Former North East Appliance, Inc., controlled by virtually same stockholders as was North East Electric Co., but which was not included in sale to General Motors, has been granted a certificate of change of name to Electromatic Typewriters.

Detroit

DETROIT, Oct. 21.—Contract has been let by Koestlin Tool & Die Co., 3601 Humboldt Avenue, Detroit, to Krieghoff Co., 6601 Humboldt Avenue, for one and two-story addition, 65 x 120 ft., to cost about $60,000 with equipment. Muller & Krecke, American Radiator Building, are architects.

United States Pressed Steel Co., Ypsilanti, Mich., has plans for one-story addition to manufacture new type of universal drive shaft for passenger automobiles, to cost about $75,000 with equipment.

Ex-Cell-O Aircraft & Tool Corporation, 1200 Oakman Avenue, Detroit, has arranged for an increase in capital, part of proceeds to be used for expansion. Company is completing an addition aggregating 62,000 sq. ft., floor space, for manufacture of new precision parts for aircraft engines, to cost about $100,000 with equipment.

Consumers Power Co., Jackson, has plans for extensions in plant at Zilwaukee, Mich., to include construction of dock for coal unloading, storage facilities for handling about 250,000 tons of coal at one time, hoisting, conveying and other coal-handling equipment, etc., to cost about $500,000.

Defoe Boat & Motor Works, Inc., Bay City, has approved expansion program at boat building plant, to cost over $75,000 with equipment.

Terrell's Equipment Co., Hall Street, Grand Rapids, manufacturer of steel equipment for factory service, lockers, etc., has awarded a general contract to John McNabb & Sons, Murray Building, for two-story top addition, 100 x 350 ft., to cost about $80,000 with equipment.

Motor Wheel Corporation, Saginaw Street, Lansing, in addition to four-story extension to wire wheel manufacturing plant, to cost about $200,000, is considering two-story addition at plant of Prudden wheel division, 80 x 475 ft., for storage and distribution, to cost $120,000 with equipment.

American Twist Drill & Tool Co., 2804 West Jefferson Avenue, Detroit, has plans for a one-story addition, 175 x 200 ft., to cost about $135,000 with equipment. C. W. Ditchy, 415 Brainard Street, is architect.

In connection with expansion program to cost about $100,000 recently authorized by Electric Auto-Lite Co., Toledo, Ohio, manufacturer of automobile starting and lighting equipment, plans are under way for extensions and improvements in plant of American Enameled Wire Co., Muskegon, with installation of equipment.

Olds Motor Works, Inc., Lansing, a subsidiary of General Motors Corporation, has plans for a new two-story unit, 75 x 141 ft., for automobile engine service for Oldsmobile Six, and for a two-story engineering laboratory, 60 x 90 ft. Work is under way on an addition to sheet metal department and an extension for parts and service divisions. Entire expansion will cost more than $1,000,000.

Panyard Piston Ring Co., Muskegon, Mich., has been incorporated with capital of $60,000 to manufacture piston rings and has purchased at receiver's sale plant of Panyard Machine & Mfg. Co. Company is in market for castings and spring steel. Philip P. Schnorbach is president and D. Briggs vice-president and general manager.

Hastings Mfg. Co., Hastings, Mich., has been organized to make automobile piston rings and is building plant, 64 x 321 ft., containing 20,000 sq. ft. manufacturing space. It is in market for equipment. C. W. Dolan is secretary.

Cleveland

CLEVELAND, Oct. 21.—Machine tool sales picked up considerably the past week following quite an extended dull period. There is also a marked increase in inquiry. Demand is well distributed through various industries and is mostly for single machines. The automotive industry, however, continues an unimportant factor in the market. The National Cash Register Co. and the Frigidaire Corporation, Dayton, Ohio, are each credited with the purchase of several lathes. Recent purchases by the Amtorg Trading Corporation for Russian tractor plants are understood to include a round lot of presses placed with an Ohio manufacturer.

Youngstown Pressed Steel Co., Warren, Ohio, subsidiary of Sharon Steel Hoop Co., Sharon, Pa., has plans for several new units, to cost $400,000 with equipment. Work will include one-story enameling works, scheduled for completion early next year.

Screw & Fastener Supply Co., 3913 Mayfield Road, Cleveland, has awarded general contract to G. W. Pelton, 19760 Lakeshore Boulevard, for one-story addition, to cost $55,000 with equipment. E. F. Devine is one of heads of company in charge.

Firestone Tire & Rubber Co., Akron, Ohio, is disposing of a preferred stock issue of $60,000,000, part of fund to be used for expansion, including developments in foreign countries. Company will soon begin superstructure for seven-story addition to Akron mill, 110 x 180 ft., to cost about $1,000,000 with machinery, and will also build branches and service units in different cities.

E. T. Pierce Co., 4903 Harlem Avenue, Cleveland, manufacturer of tools, dies, etc., will build one-story plant, 65 x 100 ft., to cost about $45,000 with equipment. G. A. Ebeling, 737 Prospect Avenue, is architect.

Mid-West Forge Co., 17301 St. Clair Avenue, Cleveland, is considering one-story addition to cost about $40,000 with equipment. R. I. Gale is president.

Ohio Injector Co., main plant and office at Wadsworth, Ohio, has started construction on a four-story addition, 280 x 340 ft. Building will be used for manufacture of brass and iron valves and is expected to be ready for operation shortly after first of year.

Werner G. Smith Co., Cleveland, manufacturer of oils for foundry trade, has been amalgamated with Archer-Daniels-Midland Linseed Co., Minneapolis, Minn., latter company having acquired a substantial interest in Smith company. No change will be made in corporate name of Werner G. Smith Co.

Chicago

CHICAGO, Oct. 21.—Machine tool dealers in this district are still busy following leads developed at the recent Cleveland show. Sales are not impressive in the absence of large lists. Scattered purchases of individual tools, many of which are of small size, are fairly numerous and inquiry of this character is more brisk than a week ago. Western Electric Co. continues to contract for large quantities of machine work and jobbing shops are profiting by this situation. A Chicago district steel mill is in the market for six tools for its maintenance department.

Used tools remain in good demand. The International Harvester Co. will buy several more for its Weber works, Chicago, and dealers from California are seeking supplies in this market.

Hafner Mfg. Co., 1010 North Kolmar Avenue, Chicago, toy manufacturer, will build a new factory, 100 x 270 ft., to cost $60,000. T. B. Jorgenson, 510 North Dearborn Street, is architect.

Johnson Motor Co., Waukegan, Ill., manufacturer of outboard motors, has started erection of an addition which, with equipment, will cost over $100,000.

McIlvaine Burner Corporation, Evanston, Ill., manufacturer of oil burners, contemplates building a new assembly plant.

Edgar T. Ward & Son, 1455 West Thirty-seventh Street, Chicago, iron and steel, will soon take bids for a one and two-story addition to storage and distributing plant, to cost over $100,000 with equipment. A. Epstein, 2001 West Pershing Road, is architect and engineer.

Grigsby-Grunow Co., 2038 North Kolmar Avenue, Chicago, manufacturer of radio equipment and sets, has purchased plant of General Motors Corporation on Dickens Avenue, consisting of building with 650,000 sq. ft. floor space and adjoining land which will be used for early erection of a multi-story addition to approximate 350,000 sq. ft. floor area. Company also plans three-story addition to plant on Armitage Avenue. Entire expansion will cost over $1,000,000 with equipment.

City Council, Ottumwa, Iowa, has plans for a municipal hydroelectric generating plant to cost about $750,000 with transmission lines, and will soon ask bids on general contract. Brown & Cook, 106 North Market Street, are engineers. Charles Wyman, City Hall, is city engineer.

Allis-Chalmers Mfg. Co., West Allis, Wis., has plans for an addition to tractor plant at Springfield, Ill., to cost more than $400,000 with equipment. Company will carry out an expansion at West Allis works, including construction of one-story forge shop and new unit for manufacture of motors, to cost about $1,500,000 with machinery.

Minneapolis Gas Light Co., 16 South Seventh Street, Minneapolis, Minn., will soon take bids for three-story equipment storage and distributing plant, with mechanical and repair divisions, to cost $180,000 with equipment. Ekman, Holm & Co., Phoenix Building, are architects. John K. Swanson, vice-president and general manager, in charge.

Brasco Mfg. Co., 5035 South Wabash Avenue, Chicago, manufacturer of metal store fronts, has acquired factory of Morgan-Gardner Electric Co., Halsted and 152nd Streets, Harvey, Ill., totaling about 50,000 sq. ft. floor space, and will use for new plant. Company is said to have plans for a one-story addition on adjoining site, to cost about $100,000 with equipment, for which bids will be asked on general contract early in November.

Temple, Inc., 1925 South Western Avenue, Chicago, manufacturer of radio equipment and devices, is considering construction of new plant unit, to cost over $125,000 with machinery.

Apex Regulator Co., 508 South Third Avenue, Marshalltown, Iowa, has been organized to manufacture pressure reducing and regulating valves, expansion valves and relief valves. Plant is in production.

National Stoker Co., 2020 Nicollet Avenue, Minneapolis, has been incorporated and is manufacturing automatic ram-type coal stokers specially adapted for burning wet screenings. Part of machine work and all of assembly work is done in company's plant. Purchase of additional equipment is contemplated. C. E. Betcher is secretary and treasurer.

Paf Mfg. Co., Greenville, Ill., manufacturer of spark plugs, is erecting a new factory at a cost of $30,000.

Milwaukee

MILWAUKEE, Oct. 21.—Machine tool bookings are running considerably ahead of those during the first three weeks of September, and October business is expected to compare favorably with that of any summer month. Many orders were taken during the Cleveland show and a large part of the pending inquiries were closed shortly after. Although the volume of automobile production is low for the season, manufacturers continue to buy some equipment.

Milwaukee Electric Railway & Light Co., 217 Michigan Street, has plans for 60,000 to 75,000-kw. steam generating plant to be constructed at Port Washington, Wis., with ultimate investment of $25,000,000. Negotiations are under way for purchase of municipal light and power plant at Port Washington.

Wrought Washer Mfg. Co., 46-54 South Bay Street, Milwaukee, has purchased property at Oklahoma and First Avenues, including 16 acres and building with 150,000 sq. ft. floor space, and will equip for own use or that of a subsidiary.

Snap-On Wrench Co., 1270 South Pierce Street, Milwaukee, will move to Kenosha where a building costing $150,000 will be completed in January, and $215,000 worth of new equipment will be installed. William Seideman is secretary, and Frank D. Chase, Inc., 720 North Michigan Avenue, Chicago, is general contractor.

Utility Mfg. Co., Portage, Wis., recently organized to manufacture ice cream freezers, metal household appliances and novelties, is building a two-story factory, 80 x 80 ft.

Board of Education, West Allis, Wis., has closed bids for construction of third unit, three stories, 40 x 57 ft., to West Allis Vocational School.

Barkhausen Oil Co., 815 South Monroe Street, Green Bay, Wis., is planning to rebuild oil refining and storage plant, damaged by recent fire.

Gulf States

BIRMINGHAM, Oct. 21. — Bids have been asked by Universal Metal Mfg. Co., Tarrant, Ala., for one-story addition, 75 x 125 ft., to cost about $28,000 with equipment. Charles H. McCauley, Jackson Building, Birmingham, is architect.

Montgomery Elevator Co., Moline Ill., manufacturer of elevators, parts, etc., has purchased property at Houston, Tex., for a new branch assembling plant, to cost about $25,000 with equipment.

Central Power & Light Co., San Antonio, Tex., has secured permission to use water from Devil's River, near Del Rio, Val Verde County, for a hydroelectric generating plant, on which work will start before close of year. Initial unit will have capacity of 45,000 kw., and will cost about $1,000,000 with transmission system.

Republic Portland Cement Co., San Antonio, Tex., is disposing of a bond issue of $1,250,000, part of fund to be used for new cement mill now being completed about 10 miles from city. Plant will have an initial output of about 100,000 bbl. per month. Terrell Bartlett Engineers, Inc., San Antonia, and Richard K. Meade & Co., 10 West Chase Street, Baltimore, are engineers.

Planters' Package Co., Crystal Springs, Miss., an interest of Hazlehurst Box Co., Hazlehurst, Miss., has authorized rebuilding of fruit and vegetable package plant recently destroyed by fire. Several new units will be built, including veneer mill, box factory, machine shop, power plant and wood-working mill. Alexander Wilson is company engineer in charge.

Officials of Engineers Public Service Co., 120 Broadway, New York, operating Baton Rouge Electric Co., Baton Rouge, La., and other electric light and power utilities, are organizing Louisiana Steam Products Co., to construct a new steam-operated generating plant adjoining refinery of Standard Oil Co. of Louisiana at Baton Rouge, utilizing residue petroleum and gases, and natural gas for fuel. Plant will have a capacity of 45,000 kw., and will cost more than $800,000 with equipment. It will furnish service to Standard Oil Co. refinery where expansion costing close to $7,000,000 is under way. C. M. Smith will be president of Louisiana Steam Products Co., which will be under executive management of Stone & Webster, Inc., 49 Federal Street, Boston, engineer.

National Portland Cement Co., Vicksburg, Miss., has plans for new mill at Fort Hill, where property has been acquired, including machine shop, power house and other buildings, to cost $1,000,000 with equipment. Work will begin in about 60 days.

Gruver Roller Bearing Co., Gruver, Tex., will erect new one-story plant 50

x 100 ft., for manufacture of roller bearings and kindred equipment, to cost $25,000 with equipment.

Texas Quarries, Inc., Austin, Tex., recently organized, will be an independent company and will not be affiliated with Indiana Limestone Co., Bedford, Ind., previously reported. Company has tract of about 4000 acres near city, and will soon begin construction of quarry plant and finishing mill to cost about $240,000 with machinery.

Gulf Pipe Line Co., a subsidiary of Gulf Oil Corporation, Frick Annex, Pittsburgh, with main refinery at Port Arthur, Tex., has purchased a 300-acre tract near Lucas, Tex., for extensions in storage and distributing plant, including steel storage tanks, pipe lines, pumping and power equipment, to cost more than $125,000.

East Coast Refrigeration Co., Lake Worth, Fla., has plans for a two-story cold storage and refrigerating plant, 65 x 125 ft., to cost about $85,000 with machinery. Daniel C. Smith is secretary.

D. S. Mair Machinery Corporation, Houston and Dallas, Tex., has been formed by D. S. Mair and Charles J. Harter to succeed D. S. Mair Machinery Co. Mr. Harter has been railroad representative in Texas for Joseph T. Ryerson & Son, Inc., and new organization will represent Ryerson company in machinery sales only for industrial and railroad uses in Texas, Louisiana and southern Arkansas. It will also represent in same territory, Whiting Corporation, Harvey, Ill., and Landis Machine Co., Waynesboro, Pa. Mr. Harter will be in charge of Dallas office, 4521 Edmondson Avenue.

Cincinnati

CINCINNATI, Oct. 21.—Although the volume of machine tool business so far this month indicates a slight recession from the level of the first half of September, fresh bookings by manufacturers the past week were larger than in the first week of October. While demand for planers and heavier tools was sustained, improvement in the call for lathes contributed to the increase.

An automobile manufacturer placed an order with a local builder for four large high-production lathes. A Pittsburgh company bought one 32-in. lathe from a local manufacturer.

Commerce Garage, 321 Race Street, Cincinnati, has awarded general contract to Hillsmith & Co., Chamber of Commerce Building, for seven-story and basement service, repair and garage building, to cost about $180,000 with equipment.

Columbus Auto Brass Co., 767 North Fourth Street, Columbus, Ohio, has awarded a general contract to F. & Y. Construction Co., 731 East Broad Street, for two-story addition, to cost about $25,000 with equipment.

Allen Mfg. Co., Tenth Avenue, North, Nashville, Tenn., manufacturer of stoves, ranges, etc., will take bids at once for one-story plant at Franklin, Tenn., with about 150,000 sq. ft. floor space, to cost $200,000 with equipment. Robert & Co., Bona Allen Building, Atlanta, Ga., are architects and engineers.

Second National Garage, Inc., American Trust Building, Nashville, Tenn., has asked bids on general contract for a multi-story garage, repair and service building, to cost about $500,000 with equipment. Hart, Freeland & Roberts, Independent Building, are architects. R. R. Ogilvie is head.

Reynolds Metals Co., Thirtieth and Grand Streets, Louisville, has arranged for increase in capital from 525,000 to 1,000,000 shares of stock, part of fund to be used for expansion. Plans have been completed for new plant near city, to cost over $100,000 with equipment. Arthur Tafel, 140 South Third Street, is architect.

Holophane Co., Newark, Ohio, manufacturer of lighting equipment, reflectors, etc., has plans for two-story addition for storage and distribution, to cost about $45,000 with equipment. Headquarters are at 342 Madison Avenue, New York.

Hauser-Stander Tank Co., Cincinnati, has received bids for new plant on an 11-acre tract in Pleasant Ridge, a suburb. Present plant on Spring Grove Avenue will be razed to make way for overhead right of way for Baltimore & Ohio Railroad.

St. Louis

ST. LOUIS, Oct. 21.—St. Louis Spring Co., 3135 Washington Street, St. Louis, manufacturer of steel springs, has leased for expansion, one-story addition to be built on adjoining site, 75 x 130 ft., to cost $40,000 with equipment. Benjamin Shapiro, Syndicate Trust Building, is architect.

Red Wing Commercial Aircraft Co., St. Joseph, Mo., has plans for new one-story plant for parts production and assembling, to cost about $55,000 with equipment.

City Council, Campbell, Mo., has plans for municipal electric light and power plant, with Diesel engine prime mover, to cost more than $85,000 with machinery. Russell & Axon, 6200 Easton Avenue, St. Louis, are engineers.

Board of Education, St. Joseph, Mo., plans installation of manual training equipment in new central high school, to cost $750,000, for which plans will be drawn by Eckel & Aldrich, Corby Building, architects; William B. Ittner, Board of Education Building, St. Louis, is associate architect.

Chicago, Rock Island & Pacific Railroad, La Salle Street Station, Chicago, W. H. Peterson, chief engineer, will soon begin construction of one-story car repair shop at Kansas City, Kan., 70 x 300 ft., to cost over $75,000 with equipment.

Century Engine Works, Inc., 3813 Independence Avenue, Kansas City, Mo., manufacturer of engines for industrial, marine and other service, is planning installation of lathes, milling machine and other tools. C. V. Fitzpatrick is vice-president, in charge.

Shell Petroleum Corporation, Shell Building, St. Louis, has plans for a new oil storage and distributing plant at Toledo, Ohio, with dock to accommodate tank steamers, to cost over $2,000,000 with mechanical-handling and other equipment.

Glenn-Smith Fuel Co., Omaha, Neb., manufacturer of fuel briquettes, is planning to rebuild part of plant destroyed by fire Oct. 7.

Topeka Airport & Aviation Co., 1345 Fillmore Street, Topeka, Kan., has plans for steel hangar with repair facilities, to cost about $35,000 with equipment.

Dodge City Terminal Elevator Co., Dodge City, Kan., will soon begin construction of grain elevator with capacity of 500,000 bu., including conveying, elevating, screening and other equipment, to cost over $100,000. Structure will be operated under lease by C. C. Isley Lumber & Grain Co., Dodge City.

St. Joseph Railway, Light, Heat & Power Co., St. Joseph, Mo., is concluding purchase of municipal electric light and power plant at Oregon, Mo., and will operate in conjunction with properties. Extensions and improvements are planned, including transmission lines.

Tiffany Aluminum Products Co., 1319 Locust Street, St. Louis, has purchased a building at Branch and Buchanan Streets, containing 17,000 sq. ft. and will remove to new location shortly after Nov. 1. About $20,000 is being spent on improvements and additional equipment.

City Council, Junction City, Kan., is planning construction of municipal electric light and power plant, to cost $425,000 with equipment. A special election has been called Oct. 22 to vote bond issue in amount noted. Charles A. Haskins, Finance Building, Kansas City, Mo., is consulting engineer.

Indiana

INDIANAPOLIS, Oct. 21.—Supplementing contract recently let for two-story mill to cost about $200,000 with equipment, United States Corrugated Fibre Box Co., 1315 Martindale Avenue, Indianapolis, has awarded contract for second unit to Hall Construction Co., Board of Trade Building, for storage and distribution, one story, 105 x 160 ft., to cost $65,000 with equipment. Charles E. Bacon, Odd Fellow Building, is architect.

Municipal Airport Commission, A. B. Ayres, chairman, Newcastle, is planning establishment of airport with hangars, repair shop and other units, to cost about $100,000 with equipment.

Dixie Sales Co., Odd Fellow Building, Indianapolis, manufacturer of special fuel, formed as a by-product of turpentine kilns, with resin, etc., is planning enlargements in plant at Douglas, Ga., to cost more than $60,000. O. C. Brown is general manager.

Dudlo Mfg. Co., Wall Street, Fort Wayne, manufacturer of electric wire, coils, etc., has awarded general contract to Indiana Engineering & Construction Co., Central Building, for addition, 65 x 75 ft., to cost about $50,000 with equipment.

General Electric Co., 1635 Broadway, Fort Wayne, headquarters at Schenectady, N. Y., has awarded general contract to Indiana Engineering & Construction Co., Central Building, for one-story addition, 50 x 70 ft., to cost about $35,000 with equipment.

Westinghouse Electric & Mfg. Co., East Pittsburgh, and 814 North Senate Street, Indianapolis, has plans for a one-story factory branch, storage and distributing plant, 80 x 90 ft., to cost about $60,000 with equipment. Charles H. Byfield, Peoples' Bank Building, is architect.

Hydroil Corporation, Lebanon, has been reorganized with capital of $250,000 to manufacture oil conditioning equipment for use by public utility companies, shipbuilding companies and industrial plants.

H. O. W. Machining Co., Fort Wayne, has been incorporated and is operating a plant at 843 Walnut Street, doing general machine production work.

Joslyn Mfg. & Supply Co., Fort Wayne, manufacturer of small steel bars, bands and shapes, will soon begin erection of an addition, 80 x 230 ft., to cost about $100,000.

New England

BOSTON, Oct. 21.—An order for 30 Pratt & Whitney 5-in. milling machines has been booked by Botwinik Brothers, Inc., for spot delivery to Middle West.

Kerite Insulated Wire & Cable Co., Seymour, Conn., has awarded general contract to H. Wales Lines Co., Meriden, Conn., for one-story and basement addition, 30 x 45 ft., to cost about $25,000 with equipment. Headquarters are at 30 Church Street, New York.

Plans are under way by Bourden Aircraft Co., Hillsgrove, R. I., for merger with Viking Flying Boat Co., New Haven, Conn., under last noted name. Consolidated organization will concentrate production at New Haven plant, which will be expanded for manufacture of Kitty Hawk aircraft, as produced by Bourden company. Robert E. Gross is president of new organization, and Reginald D. Thomas, vice-president and general manager.

C. I. Brink, Inc., 24 Gold Street, South Boston, manufacturer of electric signs and displays, has awarded general contract to William T. Reed Co., 89 Broad Street, for one-story addition, to cost about $25,000 with equipment.

Warren Foundry & Pipe Co., 201 Devonshire Street, Boston, headquarters at 11 Broadway, New York, has asked bids on general contract for one and two-story plant at Everett, Mass., to cost more than $50,000 with equipment. French & Hubbard, 210 South Street, Boston, are architects and engineers.

Superior Spring & Mfg. Co., 373 Washington Street, Hartford, Conn., has filed plans for two-story unit, 55 x 130 ft., to cost about $50,000 with equipment. K. Schulz, Sr., 118 Sheffield Avenue, is architect.

Rubel Ice Co., 200 Geneva Avenue, Boston, has plans for a new ice-manufacturing plant, to cost about $100,000 with machinery. Headquarters are at 937 Fulton Street, Brooklyn, N. Y.

DuPont Viscoloid Co., Leominster, Mass., will soon break ground for addition to manufacture new type of safety glass for automobiles, to cost $1,000,000 with machinery. Company is a subsidiary of E. I. duPont de Nemours & Co., Wilmington, Del.

Merger is being arranged between Thomson Electric Welding Co., Lynn, Mass., and Gibb Welding Machines Co., Bay City, Mich., both manufacturers of electric welding equipment. Thomson-Gibbs Electric Welding Co., will be formed to operate consolidated organization, and expansion will be carried out. It is purposed to continue production at both plants.

Possner Fire Alarm Corporation, 55 Rice Street, Providence, R. I., has been formed to manufacture automatic fire detecting systems for installation in residences and industrial buildings. Factory is now being equipped. A. W. Possner is president.

Pacific Coast

SAN FRANCISCO, Oct. 17. — Oliver United Filters Co., Fourth and Madison Streets, Oakland, Cal., manufacturer of mechanical filtering equipment, has engaged Reed & Corlett, Oakland Bank of Savings Building, architects, to prepare plans for a new plant group at Fruitvale, reported to cost about $500,000 with equipment.

Western Light & Fixture Co., Los Angeles, has awarded a general contract to William P. Neil Co., Inc., 4818 Lomita Vista Avenue, for one-story plant, 160 x 198 ft., to be used in part for storage and distribution, to cost $45,000. Lawrence Nowell, 4814 Lomita Vista Avenue, is engineer.

General Motors Corporation, General Motors Building, Detroit, is considering purchase of more than 150 acres near Los Angeles, as site for new automobile assembling works for one of its units, to cost more than $2,000,000 with equipment.

Pacific Gas & Electric Co., 245 Market Street, San Francisco, has awarded a general contract to Monson Brothers, 475 Sixth Street, for group of one-story equipment storage and distributing units, with mechanical and electrical repair departments, to cost over $200,000 with equipment.

R. F. Fleming Co., 68 North Eleventh Street, Portland, has leased a one-story building, 100 x 100 ft., to be erected at Eleventh and Everett Streets, for a new mechanical equipment and repair shop, to cost $30,000. Claussen & Claussen, Buyers Building, are architects.

Inland Power & Light Co., Public Service Building, Portland, has secured permission for a hydroelectric power project on Lewis River, near Columbia National Forest, Wash., with initial capacity of 54,000 hp., and ultimate output of 216,000 hp., to cost over $6,000,000 with transmission system.

Vancouver Cross Arms Co., Vancouver, Wash., recently organized to manufacture pole equipment for electric, telephone and other service, is planning erection of one-story factory, 70 x 560 ft., to cost about $100,000 with equipment. A traveling crane will be installed.

Board of Works, Tacoma, Wash., has awarded contract to Walesby Construction Co., Puget Sound Bank Building, for one-story municipal machine and repair shop, to cost about $25,000 with equipment.

Canada

TORONTO, Oct. 21.—Increased volume in machine tool sales was noted the past week, partly due to the closing of several small lists. Much of the demand is for replacement and consists of one or two tools to a customer. Small tools are moving freely.

It is stated that Waterloo Mfg. Co., Waterloo, Ont., and an agricultural implement company of Melbourne, Australia, are interested in a company to be formed to locate a plant at Waterloo for manufacture of a new combine thresher.

Bids will be received by Mayor S. McBride, chairman of the Board of Control, Toronto, until Nov. 5, for the supply and installation of a 10,000,000-gal. centrifugal pump and motor, for Riverdale pumping station.

Kroehler Mfg. Co., Stratford, Ont., has awarded a number of contracts for erection of a plant at Montreal, to cost $50,000.

Canadian Liquidair Co., Montreal, will erect a plant at Regina, Sask., to cost $40,000, for which bids will be called immediately.

Malcolm & Hill, Ltd., Kitchener, Ont., manufacturer of furniture, etc., will erect a factory at Regina, Sask., to cost $250,000. Construction will start early next year.

Foreign

PROPERTY at Cologne, Germany, has been acquired by Ford Motor Co., Detroit for new assembling plant to cost more than $750,000 with equipment.

Southern Railway Co., London, England, has authorized electrification of main line from London to Brighton, including branches to Worthing and Hove, about 48 miles in all, using third rail system, to cost over $2,500,000 with equipment and rolling stock.

Magnavox Co., Oakland, Cal., manufacturer of radio equipment, has plans for organization of a subsidiary to establish a plant near London, England, initial works to represent investment of more than $200,000.

Patino Mines & Enterprises Consolidated, 20 Pine Street, New York, has purchased tin smelting plant of Williams, Harvey & Co., Ltd., Bottle, Liverpool, England, and will operate in conjunction with other plants. New owner is considering improvements in property, and installation of additional equipment.

Charles F. Kamrath, 222 West Adams Street, Chicago, of Bloom & Kamrath, same address, refrigerating and packing-house engineers, has been engaged by Soviet Russian Government through Amtorg Trading Corporation, 261 Fifth Avenue, New York, to prepare plans for a modern meat-packing plant at Moscow, to be first of seven such units in European Russia and Siberia, under a five-year modernization program, to cost about $50,000,000, including mechanical-handling equipment, power and refrigerating machinery, etc., larger part of which is expected to be of American manufacture. Frank W. Marlow, formerly in engineering department of Armour & Co., Chicago, will be associated with engineers in work.

New Trade Publications

Tool Steels.—A. Milne & Co., 741 Washington Street, New York. Booklet divided into 12 sections devoted to tool steels, hollow tool steels, drill steels, Wardlow's products, anvils, Swedish Lancashire iron, Swedish electrical iron, Reynolds' aircraft tubing, tool hammers and picks, ball bearing steels, specialties, specifications and tables.

Flow-Meters.—Brown Instrument Co., Philadelphia. Bulletin of 32 pages, illustrated, showing the application of steam flow-meters in making economies in a steam plant operation estimated to cost $2,000,000,000 a year in the United States.

Oil-Burner Boilers.—Johnston Brothers, Ferrysburg, Mich. Catalog No. 29 of 12 pages illustrates and describes a steel boiler built in three sizes for residential use, to heat with oil as fuel. Features indicated are vertical, straight-line circulation and long gas travel, compared with conditions found in the usual domestic heating boiler.

Conveyor Equipment.—Saginaw Stamping & Tool Co., Saginaw, Mich. Catalog 29-CE of 42 pages illustrates and describes, with price list, the component parts of overhead conveyors for use in manufacturing plants and other places. Illustrations of installations are mainly, though not wholly, automotive. Trolley wheels are shown with both ball and roller bearings.

Gear-Grinding Chuck.—City Machine & Tool Works, Dayton, Ohio. Folder

of four pages illustrating and describing the Bolender gear-grinding chuck, in which the gears are so held while grinding that the bore is definitely concentric with the pitch line of the teeth.

Motor-Generator Sets.—Roth Brothers & Co., Chicago. A four-page bulletin, No. 20-301, sets forth information about Roth motor-generator sets.

Ingot Iron in the Oil Industry.—American Rolling Mill Co., Middletown, Ohio. "How Armco Ingot Iron Saves in the Oil Industry" is the title of a handsomely illustrated 32-page booklet which describes the advantages to be gained by using Armco ingot iron in the construction of equipment for refining, producing and marketing oil.

Mechanical Drive Turbines.—General Electric Co., Schenectady, N. Y. Bulletins 957-A and 197-B of four pages each illustrate two types of mechanical drive turbines. The first includes units up to 600 hp. and up to 6000 r.p.m., while the other includes units up to 500 hp. of 1200 to 4000 r.p.m. Both types may be had either condensing or non-condensing.

Improved Stable-Arc Welders.—Lincoln Electric Co., Cleveland. Four-page folder describing four improved models with separately-excited generator field and reactor in the arc circuit.

Floor Plate.—Alan Wood Steel Co., Conshohocken, Pa. Illustrated, eight-page pamphlet on "A W" Diamondette floor plates for use on car platforms, motor bus running boards and other applications where a light-section material will serve. For general structural purposes, where the plate itself must sustain the load, the company recommends the use of standard "A W" diamond pattern rolled steel floor plates.

Alloy Iron Castings.—Duriron Co., Inc., Dayton, Ohio. Bulletin No. 157 of four pages, illustrated, is entitled "Duriron Kettles and Tanks." It describes some special products which are used in the chemical industry as made by this company's special high-silicon alloy. A discussion of their design is particularly emphasized.

Alloy Iron Castings.—International Nickel Co., New York. A four-page leaflet entitled "Quality Castings," illustrated, discusses the use of "F" nickel in the manufacture of various types of castings. Under eight different sections some of the many uses and products, as well as important users, are outlined.

Electric Furnaces.—General Electric Co., Schenectady, N. Y. An illustrated booklet of 20 pages, attractively presented, discusses the general subject of "Electric Furnaces for Industrial Use," using at the same time the slogan, "Ultimately—Electric Heat in Every Industry." About 32 applications of various forms of furnaces for electric heating are illustrated and briefly discussed.

Lubricating Systems.—Keystone Lubricating Co., Twenty-first and Clearfield Streets, Philadelphia. Illustrated folder of 12 pages devoted to the pneuma-lectric lubricating system, which is said to give automatic attention to machinery of all descriptions. It is controlled by clock movement determining the frequency of application of lubrication.

The Week's News Quickly Told

Current Events That Bear on the Course of Business

ALL naval powers have accepted the invitation to meet in London and consider limitation. The Japanese Naval Minister said that the real purpose of the meeting is to effect "positive reduction of armaments to a condition in which no nation could attack another."

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MARKETS are spotty. The pace of business remains high as measured by 1928, but slow as measured by the spring of 1929 . . . Wheat prices are 5 to 6c. lower as the visible supply increases; export trade is rather slow and the milling rate is smaller than the 5-year average . . . Hardware is in good demand and prospects are good for the remainder of the year . . . Stocks and securities declined sharply, despite many evidences of easy money and a statement by C. E. Mitchell, president, National City Bank, that he sees no reason for an end-of-the-year slump in business expected by many . . . Retail trade is generally satisfactory except in the North Central States.

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EMPLOYMENT in manufacturing industries during September was 4.5 per cent higher than a year ago, and payrolls 7.5 per cent greater. All industries shared in the advance except ceramics, tobacco and vehicles . . . Federal Reserve Board predicts that the agricultural income will be at least as large as 1928, and finds no evidence of curtailed purchasing power in farm centers.

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ELECTRICAL industries are especially active, the employment index now being 127.3 as compared with 98.0 a year ago . . . General Electric Company's orders are 29 per cent greater than in the third quarter of 1928 . . . Coincident with "Light's Golden Jubilee" many large projects are announced, such as a 230,000-hp. hydroelectric plant on the Susquehanna, a 375,000-hp. steam-electric plant near Milwaukee, a $6,000,000 plant at Baton Rouge using oil refinery residues for fuel, and an $80,000,000 extension of underground power circuits in New York.

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TELEPHONE profits for the third quarter are $40,600,000, so much larger than last year that a reduction in toll charges is in prospect . . . Profits of Western Union are about the same as last year . . . International Combustion Engineering Corporation (manufacturer of power plant equipment) and United Cigar Stores Company both passed their usual dividend . . . Chrysler Corporation earned $1.49 per share the last quarter, as compared to $2.29 in 1928. Slow delivery of bodies for new models is blamed for decreased sales.

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COTTON prices are sagging . . . Government estimates place the total crop at 14,915,000 bales, than which only two were higher in the last 10 years. Texas alone has a disappointing yield . . . Cotton cooperatives have received the lion's share of the $57,000,000 in loans so far approved by the Federal Farm Board, but of this total only $700,000 has actually been called for . . . Alexander Legge, chairman Federal Farm Board, said that while all its activities have so far been designed to strengthen the cooperatives, in an emergency the Board would be justified in purchasing and storing a portion of a crop to maintain a reasonable price.

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TEXTILES are in generally satisfactory condition. Philadelphia plants are especially busy. Finished cotton goods are active. Prices of woolen fabrics for women's spring wear, announced by American Woolen Company, are from 3 to 10c. a yard lower than quoted last fall.

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PENSIONS and group life insurance are both provided in a new plan arranged for employees of the Southern Railway System . . . About 20,000 establishments now have group insurance for employees, and annual benefits total $80,000,000 . . . A uniform and model old-age pension law, providing for at least $300 per year for persons over 65, will be vigorously promoted in all States by the American Federation of Labor. . . . Lieutenant Governor Lehman of New York said that State assistance to aged citizens is no more revolutionary a project than the construction of an orphan asylum.

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FREIGHT car loadings decline a little in all classifications except grain and live stock . . . The Interstate Commerce Commission, acting on its so-called O'Fallon decision, finds that the cost of reproducing the New York Interconnecting railroad would be $24,500,000, instead of $27,700,000, the company's book value . . . Baltimore has leased to Western Maryland Railway the $8,500,000 freight terminal constructed in accordance with comprehensive plans for improving the harbor, costing $50,000,000.